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Report of the Royal Commission on the Status of Pensions in Ontario

VOLUME V

Ontario and the Canada Pension Plan

1980

Report of the Royal Commission on the Status of Pensions in Ontario

Design for Retirement

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Ontario and the Canada Pension Plan

The Royal Commission on the Status of Pensions in Ontario

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Foreword



The Commission's position is that retirement income provision is primarily an individual responsibility. It sees the role of government to be threefold:

1. to provide a minimum adequate income in retirement for everyone;
2. to provide a social scheme for replacement of pre-retirement income in retirement at low levels of income;
3. to provide incentives for the individual to make his or her own arrangements for retirement income.

The Canada Pension Plan is the method by which government up to now, has sought to carry out the second of these roles. After extensive study the Commission is satisfied that the plan, although the subject of much criticism in recent years, should continue to play a large part in the social security design.

The Commission makes a number of recommendations on the course the Government of Ontario should follow to secure the future operation of the CPP. While the full discussion warrants a separate volume of the report, this is not to suggest that the CPP recommendations should be considered in isolation. The mandatory plan (PURS) recommended in an earlier part of the report is to be seen as a key component for an effective social security scheme. The Canada Pension Plan is only one piece, albeit an important one, in the mosaic of Design for Retirement.

How much government can do in fulfilling its various roles will be governed by cost and social priorities. We have attempted an assessment of the future cost of all social security aspects, encompassing Old Age Security with its Guaranteed Income Supplement and Spouse's Allowance, GAINS, and the Canada Pension Plan. Only by looking at potential over-all cost can we judge whether more can and should be done to provide income in retirement through government means.

Donna J. Haley, Q.C.
Chairman

Introduction

Typical of public concerns are the following comments from "Canada Pension dues will have to increase," by Dian Cohen, in the Montreal Star, November 20, 1977:

"....the Canadian Pension Plan will run out of money long before today's 'prime age workers' reach retirement age."

"....Right now, there is one retired person for every seven working people. Fifty years from now, there will be more than two retired people for every seven working people. This means that even if there is no increase in the average income of the retired, the pension burden must more than double."

"....But those reserves now fall far below actuarial standards that would ensure that every retired Canadian worker gets a retirement income."

"....Not only is a lot of this pension money (from the CPP) being invested at substandard rates, there are suggestions that it isn't being invested at all, but is being used to pay for current expenses."

"....It's interesting that the push nowadays for an end to mandatory retirement coincides with an increasingly wide recognition that retirement money is running out."

These same problems are described in more sophisticated terms by Laurence Coward, Vice-President of William M. Mercer Limited:

"The current arrangement became a cause for concern for several reasons. First the projections in the actuarial reports on the Canada Pension Plan showed that the benefit outgo would increase much faster than the contribution income. Thus, according to the 1973 actuarial report, the benefit payments from the Canada Pension Plan would first exceed the contribution income in 1982. Further,

unless the plan were amended by law the benefit outgo would exceed the contributions plus interest on the investments in 1988. At this point the fund would begin to decrease and the fund would be totally exhausted by the year 1999. Although similar projections were made when the Canada Pension Plan was started and it was well understood that contributions would have to be raised at some time, the projections showed that the time for action was near.

"During the early 1970s the position of many employer pension plans deteriorated. Salaries and wages rose fast in an attempt to keep up with inflation. Pension costs and liabilities rose in sympathy with earnings and, at the same time, the market value of pension fund assets fell. Substantial deficits were shown in many actuarial valuations. Under the Pension Benefits Acts such 'experience deficiencies' normally have to be made up by special payments within five years from the valuation date. Some employers had difficulty in meeting the extra payments required and there was much discussion of the supposed 'crisis in pensions.' Scare stories appeared in the news media and many people came to believe that all pension plans were in trouble, including private sector plans, plans for government employees and social security plans.

"In 1972 and 1973 the Government of Canada, in response to growing inflation, added cost of living indexing to nearly all of the programs for which it was responsible. Full adjustments for increases in the CPI were added to Old Age Security, Canada Pension Plan, Unemployment Insurance and pensions for federal public servants. The very high potential cost of this unlimited indexing gradually became apparent.

"Attention was also focused on demographic trends. The changing age distribution was clearly seen in the large number of young people trying to enter the labour force at a time of serious unemployment, while school enrolment fell drastically leaving a surplus of schools and teachers. The post-war 'baby boom' was a remarkable phenomenon. In the 1950s fertility rates reached a level that had not been known for many decades. In the period 1945 to 1965 about 1-1/2 million children were born in Canada over and above what might be considered normal, although of course opinions may differ as to how the norm should be defined. During the 1960s the birth rate fell steadily and in recent years has been exceptionally low. In fact the current birth rate is below replacement level so that if it continued indefinitely it would result in a falling population.

"Concern was expressed that, when people born in the 'baby boom' years retired after 2015, the burden on the working population would then be so great that the government might renege on its promises and cut back on CPP benefits. For these reasons a belief

grew that the Canada Pension Plan was unsoundly financed and that a much larger fund should be built up from increased contributions.

"To sum up, serious misgivings as to the soundness of the Canadian pension system arose as a result of the need to raise CPP contributions in the 1980s, the deficits in employer pension plans caused by inflation, the high cost of indexing pensions and the baby boom."(1)

All of these concerns, whether expressed in popular terms or in the language of the pension industry, continue today with different facets coming to the fore as more reports are received on declining population trends, unemployment, and increasing inflation.

At the same time that it became clear that decisions on the future of the Canada Pension Plan (CPP) would have to be made soon, the Treasurer of Ontario called for consideration of a scheme for funding the CPP along the lines required for employment pension plans.(2) As well as reducing the intergenerational subsidy problem it was suggested that the funding of the CPP on more or less conventional lines would generate a very large capital pool which, if invested in productive enterprises, would stimulate the economy, create jobs, and raise the standard of living.

There is disagreement on whether the Canada Pension Plan is the proper place to raise money for Canada's capital needs. There is also doubt whether provincial governments would invest the capital generated by the CPP in productive enterprises or treat it as general revenue. Some argue that the experience over the years since the commencement of the CPP suggests that the funds already accumulated have not been wisely used by the provinces and that capital investment has not been raised significantly or has actually been impaired.

Full funding of the CPP has implications for both contribution levels and fund size which have been attacked by those favouring the continuance of a basic pay-as-you-go approach. The arguments run along the following lines:

- To provide for a larger fund would, of course, mean increasing contributions from employers and workers even more than they would have to be increased under present arrangements. Such increased contributions constitute a regressive tax, bearing most heavily on low-income workers and less heavily on those who earn more than the Year's Maximum Pensionable Earnings (YMPE).(3) Such a tax would tend to depress the economy at a time when, according to many experts, stimulation is needed. Further, other forms of saving might be reduced because of the forced saving in the Canada Pension Plan.

- Stronger funding of the CPP would aggravate the problems of managing the fund. If such a fund were invested entirely in government securities would the money so invested ultimately be used to maximize the productive capacity of the country? If billions of dollars of CPP funds were invested in marketable securities, the transactions of CPP fund managers would tend to dominate the stock and bond markets. Investment responsibility would have to be divided among a considerable number of investment managers if the market were to operate at all normally after such a vast influx of funds. Difficult questions concerning the ownership and control of business enterprises and the competitiveness and efficiency of the security markets would have to be answered.

The high level of public awareness of the Canada Pension Plan underlines the need to examine all these concerns in depth. It is important that the public have confidence in a public pension scheme which for many will be the only source of employment-related retirement income. It is even more important that public confidence be placed only in a sound and efficient vehicle. The Commission therefore has undertaken extensive projections in order to establish a factual base from which each of the concerns can be explored. Not all will agree with the Commission's conclusions drawn from facts, but all of the data are available for careful study. Selected tables from the Commission's projections are published in several appendices in this volume. The complete computer runs from which the tables were constructed have been filed with the Ontario Archivist and are available for study. It is time that statements about the Canada Pension Plan were based on a full understanding of the nature of its problems and with just consideration of the long-run consequences of any solutions that may be considered in the next few years.

NOTES

- (1) Laurence E. Coward, draft paper prepared for the Royal Commission on funding of the Canada Pension Plan.
- (2) Ministry of Treasury, Economics, and Intergovernmental Affairs, "Review of Issues in Financing the Canada Pension Plan," April 1976.
- (3) For an explanation of "Year's Maximum Pensionable Earnings" and other technical terms in the text see the Glossary, Volume III.

Ontario and the Canada Pension Plan

Volume V

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Chapter 1

History of the Canada Pension Plan

THE BACKGROUND

"My ministers have undertaken to establish a comprehensive system of contributory pensions. The new pensions will be co-ordinated with the existing provisions for old-age security, for the purpose of enabling all Canadians to retire in security and with dignity. While the arrangements required for this great advance in the social security of our people are necessarily complex, the legislation submitted to you will be designed to make the new pension plan operative as soon as possible."(1)

These words on May 16, 1963 marked the first parliamentary appearance of what was to be the Canada Pension Plan, although it was by no means the first indication of federal government involvement in the retirement pension field. The federal election campaign of 1957 had seen the matter of contributory pensions raised, with the U.S. Social Security program cited as a model.(2) Canada was not alone in looking at the concept of a publicly supported earnings-related plan as an extension of the existing flat rate (OAS) benefit and, as in the past, the impetus for reform was not confined to this country. At the end of World War I the subject of old age pensions had appeared in the Labour Convention that became part of the Treaty of Versailles, and reflected views held in Europe and North America that social reform should be a priority in the postwar years. Canada's means-tested Old Age Pension came into being in 1927. Similarly, growing opposition to the means test after the Second World War led to the development of universal, flat-rate plans in a number of countries, with Canada's Old Age Security program being introduced in 1951. Later, as Kenneth Bryden relates in his book on old age pensions:

"...just as differing interests in opposition to the means test had converged in the late 1940s, so now those primarily concerned with controlling costs and those whose main motive was to improve benefits began to find common ground in advocating a contributory plan. It is worth noting that similar pressures were operating in other countries where the pension was on a flat-rate basis. Both the United Kingdom and Sweden, for example, superimposed contributory earnings-related pensions on their plans in 1959."(3)

Clark Inquiry, 1958

By that time, Canada had taken a step in the same direction. In 1958 the Government of Canada commissioned Professor R.M. Clark to prepare a comparative study of the Canadian Old Age Security plan and the U.S. Social Security plan, on the stated assumption that the latter provided superior benefits.(4) The Clark report, presented the following year, made no recommendations, but provided:

"...a comprehensive analysis of both public and private provision of pensions in the two countries and...a presentation of arguments for and against universal and contributory pensions. His exposition of how the U.S. system actually worked made it hard to escape the conclusion that it was not transferable to Canada. Nor was it by any means crystal clear, as Conservative speeches and even the terms of reference had assumed, that old age pensioners were treated more generously on the whole in the United States than in Canada."(5)

What did result from the study, however, was the government's decision that survivor and disability benefits ought to be an integral part of any earnings-related plan. To this end the Prime Minister, in January 1962, sought the agreement of the provinces on an amendment to Section 94A of the British North America Act (added in 1951 to allow Parliament to enact old age pensions) to permit survivor and disability benefits to be paid by the federal government. Nine provinces agreed(6) but Quebec refused assent in January 1963, and the proposal languished when the federal government was defeated in the election of April that year.

Ontario's Initiative, 1962

An important parallel development was the introduction, in April 1962, of a draft Pension Benefits Act in Ontario "for study and discussion only." Included in the bill were standards for vesting, funding, and portability of employment pensions; and, as a move toward broader coverage, pension plans were to be mandatory for employers with 15 or more employees. The same concerns about lack of coverage, solvency, and portability in employment plans that led successive federal governments to consider earnings-related plans(7) were reflected in Ontario's innovation, a provincially-portable plan with minimum benefits and

conditions. The Pension Benefits Act(8) was again introduced in March 1963 and passed by the legislature on April 26. At the same time, pension reform was being proposed in the province of Quebec, where a change in government in 1960 had been followed by a legislative program which emphasized on the one hand social policy changes and on the other, a desire for provincial autonomy in such matters.

THE DEBATE

In light of these provincial initiatives, it is understandable that contributory pensions were prominent in the 1963 federal election campaign; the Liberal, Conservative, and New Democratic parties were all committed to the principle.(9) Following the election, the matter of a contributory earnings-related plan became a priority in the "sixty days of decision" promised by the incoming government. As we have seen, the Speech from the Throne included a reference to "a comprehensive system of contributory pensions." A resolution was introduced in the House of Commons on June 21, 1963 and agreed to; and this was followed by the tabling of a White Paper on the subject, July 18. Meanwhile, the text of the resolution had been forwarded to the premiers with a suggestion for an early federal-provincial conference. Here it should be noted that the emerging Canada Pension Plan was being discussed against a backdrop of negotiations on direct federal loans to municipalities, youth allowances, student loans, and fiscal transfers; as a consequence, jurisdictional arguments were very much to the fore. The ultimate ceding of provincial jurisdiction to Parliament in order to establish the CPP could be attained only at the expense of significant changes in the original proposal - including some which could be said to improve rather than dilute the plan provisions.

Proposed OAS Increase

The June 21 resolution included the following provisions:

"...for the payment of an additional pension of ten dollars a month to all persons to whom a pension may be paid under the Old Age Security Act; for the adjustment of pensions payable under the Old Age Security Act to co-ordinate such pensions with the new plan."
(10)

The purpose of this measure, raising the OAS amount to \$75 per month, was to compensate persons too old to benefit from the new Canada Pension Plan. Under the pay-as-you-go method of financing, contributions of CPP members would pay for the increased universal benefit; this meant an even more direct intergeneration subsidy than that which finally emerged in the structure of the plan. In addition, since reduced CPP benefits were to be available for retirement between ages 65 and 70, the same provision was extended to Old Age Security pensions, which were expected to range from \$75 per month at age 70 down to \$51 at age 65.

OAS Increased Independently

As the debate proceeded, and it became evident that completion of the Canada Pension Plan involved a more protracted process than originally envisaged, pressure grew for a separation of the \$10 OAS increase from formulation of the contributory scheme. Consequently, the government introduced a resolution on September 30, 1963, increasing the OAS benefit to \$75 per month and at the same time increasing from 3 per cent to 4 per cent the Old Age Security tax on personal incomes. The measure became effective on October 1. At the same time certain related programs were improved, as Bryden notes:

"The Old Age Assistance, Blind Persons, and Disabled Persons Acts were also amended to raise to \$75 a month the maximum means-test pensions in which the federal government would share, with corresponding increases in maximum allowable income....Seven provinces and the Yukon made these increases effective from December 1, 1963, and Newfoundland, Prince Edward Island, Quebec, and the Northwest Territories from April 1, 1964."(11)

In place of a reduction in benefits for earlier retirement, the age of eligibility for OAS would be reduced to 65 one year at a time, beginning in 1966. As further compensation for those already retired and unable to benefit from the new earnings-related plan the Guaranteed Income Supplement was introduced in 1967. A discussion of the development of OAS and GIS since the mid-1960s may be found in Volume I, Chapter 3.

CPP Proposals - Basic Features

The major provisions of the initial White Paper, the two federal acts and the Quebec proposal and the provisions in force in 1979 are compared in the chart at the end of this chapter. To be discussed here is the philosophy underlying the original provisions, and how it evolved to arrive at the design that was finally adopted in 1965. From the beginning the government declared its openness to suggested improvements:

"...the contributory plan to which this government has bound itself is inflexible only in its main purpose. The government will therefore welcome from any member any contribution or suggestion genuinely designed to improve the legislation, particularly as all other parties have already committed themselves to the principle and idea of contributory pensions"(12)

The "main purpose" was defined in terms of certain widely accepted principles:

"Each party has gone on record, reflecting the generally held feeling in this country, that such a scheme must be comprehensive

so that it applies to the widest possible group of Canadians, and it must be as inexpensive as possible while returning an adequate pension to the individual. It must be truly portable..."(13)

In brief, the program outlined in the summer of 1963 contained the following features:

- compulsory coverage for paid employees but voluntary for the self-employed since the latter would be contributing at twice the rate; the Armed forces and RCMP were to be excluded.
- funding would be on a pay-as-you-go basis. "It is possible...to construct a scheme which...is completely funded; but this would put in the hands of the state tremendous sums of money which would be withdrawn or used for other purposes."(14)
- contributions would be 2 per cent of earnings, split between employee and employer in the case of those employed, up to a ceiling of \$4,000. "Average earnings in the country are approximately \$4000 per year, and for this reason this figure has been chosen as the starting level."(15)
- pensions would be payable in full at age 70, or on a permanently reduced basis as early as age 65.
- there would be a transition period of 10 years before pensions reached their full rate, to allow existing employer-sponsored plans to adjust to the new program.
- after the transition period benefits would amount to 30 per cent of pensionable earnings at age 70, scaling down to 20 per cent at age 65.
- some years of low earnings could be dropped from the calculation of pensions, and contributions after age 65 could be substituted for prior low-earnings periods.
- earnings ceilings would be adjusted "with changes in the general level of wages and salaries".(16)
- surviving spouse benefits would be provided, without discrimination on the basis of sex, after age 65.

During the debate, the Minister of National Health and Welfare outlined some uncovered areas that might be dealt with:

"...ideally there would be provision in it for benefits to be paid at least to three classes of persons not now covered. There would be widows with dependent children; those contributors who, because they become disabled before reaching the age of 65 and no longer

have regular earnings are now covered only by assistance programs, and orphans of contributors."(17)

The minister noted that a constitutional amendment would be required to permit such changes, but gave no indication that the government intended to seek such an amendment.

The question of the method of funding drew criticism from the New Democratic Party:

"The way the government's plan is worked out, with all its sophistry about leaving large areas to private plans and individual choice, means that large amounts of the people's savings will still be in private hands, in the hands of the insurance companies to be used for investment in ways in which they think fit rather than the people deciding through their government on how they should best be used."(18)

For the most part, though, formulation of the plan was a matter for federal-provincial rather than parliamentary debates.

Issues in Public Controversy

The federal-provincial conference of September 9 and 10, 1963, appointed a technical committee to find common ground between the proposed CPP and Ontario's mandated plan. By that time it was assumed that the federal proposals would have to be revised. Questions in the House of Commons elicited little information about the government's intention to proceed during the current session. In the meantime the public debate was escalating. At the end of July, the Great West Life Assurance Company had distributed a pamphlet, "Let's Raise a Storm," based on a speech of the president, which sought to prevent implementation of the proposed plan. In late October the Minister of National Health and Welfare advised Parliament that

"We in my department have taken a box score....letters from individuals have run three to one in favour of the Canada pension plan. However, I must confess that from organizations such as insurance companies and trust companies almost the opposite ratio has been true."(19)

However she also noted that

"...a well known actuarial firm in its monthly newsletter referred in glowing tones to the government's actuarial report, and it is a fact that not one solitary voice in this country has demonstrated in any way or even attempted to attack the actuarial basis of the pension plan as being incorrect or fraudulent."(20)

The combined efforts of the insurance and trust companies and the Chamber of Commerce elicited a counter-campaign in favour of the Canada Pension Plan by the Canadian Labour Congress. Bryden comments that: "the campaign undoubtedly helped to offset the insurance industry's efforts....By the time of the joint committee's hearings, even the Chamber of Commerce appeared ready to acquiesce in the inevitable." (21)

Throughout the autumn of 1963 various plan design options were being discussed, although policy direction remained generally consistent with the outline presented to Parliament during the summer. For example, the leader of the New Democratic Party asked on December 5 about an alleged federal offer to return half the funds to the provinces; the Prime Minister replied that it was not an offer but merely one of a number of methods of dividing the surplus in a contingency fund; it was still not intended that the plan be funded. (22) And on December 14 the Leader of the Opposition asked about a report emanating from the federal-provincial conference to the effect that Quebec was proposing a 4 per cent rather than a 2 per cent contribution rate as the price of its consent to a constitutional amendment. The Prime Minister answered that Quebec had not proposed 4 per cent for the Canada Pension Plan although that rate was suggested for Quebec's own plan; and since survivor benefits for persons under age 65 were not yet included, no constitutional amendment was needed. (23) However, on January 11, 1964 the Prime Minister wrote to the provincial premiers to outline a revised proposal that had resulted from their discussions. The Speech from the Throne opening the second session, February 18, included the following passage:

"A measure will be placed before you to establish a comprehensive system of contributory pensions." (24)

Revised Proposals, 1964

Details of the revised plan were provided by the Prime Minister on February 20, 1964 during the Throne Speech Debate. The principal change was the federal government's acceptance of a higher earnings ceiling, resulting in an initial fund that would be available for provincial investment, coupled with a scaled-down benefit level so that pensions could be taken between ages 65 and 70 at a reduced rate - 20 rather than 25 per cent of average pensionable earnings. While the Prime Minister allowed that "our consultations with the provinces have led us to accept this revision as a reasonable one," (25) on the basis that too high benefits over a short transition period might induce people to leave their private plans, he conceded that they were "less impressed" by criticisms of the Premier of Ontario that hinged on the 10-year transition period. Ontario was arguing for a longer transition before benefits became payable at their full rate, on the grounds that it would cause less disruption to the terms and provisions of existing plans. Quebec, for similar reasons, was also interested in a longer period - 20 years - in the case of its own plan. The Prime Minister commented:

"It is an important consideration, and I do not underestimate its importance. But it is also important that only about 30 per cent of the Canadians now at work are beneficiaries under existing plans. The urgent social need is surely to provide for the other 70 per cent, who are not now covered."(26)

In the end the federal government's view prevailed and a 10-year transition period was adopted for both the Canada and Quebec plans. Saskatchewan, meanwhile, had argued against the cut-back in benefits.

At the same time the matter of coverage was receiving attention; some bodies, prominent among them the Canadian Federation of Agriculture, were suggesting that the self-employed also ought to be included on a compulsory basis to ensure that they would have pension benefits to look forward to in old age. In the long term, this viewpoint prevailed, and the act that received Royal Assent not only mandated coverage for both paid employees and the self-employed but, as the result of an amendment at committee stage also included the RCMP and Armed Forces, hitherto excluded.

Bill C-75 and Provincial Response

The introduction of Bill C-75 on March 17, 1964 led straight into the debate on the revised proposal. Apart from the lower benefit level and higher earnings ceiling that resulted in a surplus available for provincial investment (particularly since the \$10 per month increase in the flat-rate Old Age Security would not have to come from the CPP contributions), and a suggested dropout provision of 10 per cent of low-earnings months, there was little essential change from the proposals of the previous summer. However, two weeks later at the federal-provincial conference in Quebec City, the whole matter was put in doubt when Quebec outlined proposals for its own plan:

"The effect was electric. To most of the other provinces, Quebec's formulation seemed far superior to that of the federal governmentQuebec's plan made extensive provision for survivor, death, and disability benefits....Beyond providing these additional benefits, the Quebec formulation also provided higher maximum old age benefits than Ottawa's, less regressivity in the contribution structure, and substantially greater funding. The last feature attracted particular attention among the other provinces."(27)

When the conference ended on April 2 a major rift existed between the governments of Canada and Quebec largely on the basis of fiscal arrangements rather than the proposed pension plan, although Ontario announced its intention of looking to its own "standard" pension plan. The turmoil was not reflected in the resultant communique, which read in part:

"The federal proposals for the Canada pension plan were further discussed. The government of Quebec indicated that its proposed plan would be one which could provide portability of benefits with the Canada pension plan, and there was general agreement to ensure the widest possible pension coverage for Canadians."(28)

The apparent change of position by the Ontario Government became the subject of much discussion. In answer to many criticisms Premier Robarts in a speech on April 8, outlined his concern with the funds available to the province for investment if a national plan were introduced, adding:

"I have been accused many times of scuttling the Canada Pension Plan. I think it is now evident that I have not so intended, nor have I so done. I have tried for and fought for the best possible pension arrangements for the people of Ontario and at the same time have been aware of our responsibility as part of Canada."(29)

Behind-the-scenes efforts by officials of Quebec and the federal government allowed the Prime Minister to announce to provincial premiers on April 16, and to Parliament on April 20, that a solution had been found to the problems; and the terms of the two proposed plans would be dovetailed.(30) Also on April 20 the Premier of Ontario announced to the legislature that most of Ontario's concerns had been answered and that it was the government's intention to amend the Pension Benefits Act to remove Part IV dealing with mandatory plan provisions.(31) The amendment was duly passed on May 7. While there is no reason to assume that the two laws would have been incompatible or mutually exclusive, they had been widely regarded as such. At the same time, however, the Premier appeared to keep open the option of establishing a provincial plan parallel to the CPP, as Quebec intended.(32)

The result of the Canada-Quebec negotiations was a compromise, as can be seen from the chart at the end of this chapter.

- Canada, which had received other representations on the subject in any case, agreed to the Quebec proposal that coverage be mandatory for self-employed persons, although the RCMP and Armed Forces continued to be excluded.
- Middle ground was reached between the federal proposal for a total 2 per cent contribution on all earnings up to \$4,500 and the Quebec proposal of a total 4 per cent contribution on earnings between a basic exemption of \$1,000 and a maximum of \$6,000. The solution was a combined 3.6 per cent rate between a basic \$600 exemption (\$800 for the self-employed) and a maximum of \$5,000. Quebec agreed to allow contributions by persons over age 65.

- The benefit rate arrived at was the 25 per cent proposed by Quebec, up from 20 per cent in the federal proposal but halfway in the range of 20 per cent to 30 per cent originally proposed by Canada.
- Quebec's more inclusive survivor, death, and disability provisions were incorporated into the Canada plan, though this entailed provision of survivor benefits to disabled widowers only, a retreat from the sexual equality embodied in the original federal proposals.
- The federal proposal for dropping a set percentage of low-earnings months from the benefit calculation was accepted by Quebec in place of a sliding scale based on age.
- The federal proposal had been to escalate the earnings ceiling according to an "earnings index"; Quebec had proposed to escalate the earnings ceiling and benefits according to the Consumer Price Index with a minimum of 1 per cent and a maximum of 2 per cent. The solution was the development of the Pension Index, based on the Consumer Price Index, used to escalate benefits and (pending development of an Earnings Index) the earning's ceiling, starting in 1968 and both subject to the 2 per cent annual maximum.
- Both Canada and Quebec had proposed a retirement and earnings test between ages 65 and 70.

Funding Basis

The major structural change from the earlier federal proposals was in the move from a very low contributory rate under the original pay-as-you-go scheme to a rate high enough to create an initial surplus for provincial investment. While remaining essentially a pay-as-you-go plan, the CPP with its combination of higher contribution rate, higher earnings ceiling, lower benefit rate, and removal of the cost of the OAS increase now would accumulate an initial fund much larger than had been projected in the 1963 proposals. Under Bill C-75 Canada had offered one-half of the somewhat increased fund to the provinces for investment; Ontario had argued for 90 per cent on the basis that the remaining 10 per cent would be a fund of the same dimensions as the contingency fund under the original proposal. In the result, the federal government would hold only "the estimated amount required to pay benefits and administrative costs over a three-month period."⁽³³⁾ The remainder would be provided to each province in proportion to the contributions from that province, and any funds not borrowed by provinces would be invested in federal securities. This arrangement was the price of provincial participation in a nationally-administered plan.

Once accommodation had been reached between the Canada and Quebec plans the way was clear for parliamentary examination of the revised proposals. On June 18, 1964 Parliament was presented with the text of an address to Westminster amending Section 94A of the BNA Act,(34) which it approved. On August 10 a white paper was tabled,(35) followed by a revised motion introduced by the Minister of National Health and Welfare on October 28.(36) With the introduction of Bill C-136 on November 9, the debate began. The Bill received second reading on November 18 and was referred to a Joint Committee of the Commons and the Senate, empowered to hear witnesses and receive submissions.

Amending Formula

Bill C-136 contained one further provision that had not previously been mentioned - an amending formula whereby the federal legislation could be amended only with approval of two-thirds of the provinces having two-thirds of the affected population and requiring three years' notice of changes in contribution rates and benefit levels. The measure was incorporated principally at the insistence of Ontario who feared that Parliament otherwise might act against the interests of the provinces. The federal government, anxious to have the plan administered nationally, conceded the point; Parliament thereby allowed the provinces to exercise control over the legislation.(37) The concession in effect gave Ontario a veto since this province has a large enough population to deny the two-thirds approval even when all other provinces are agreed. Ontario has exercised its veto once, in the matter of the child-rearing dropout proposal.(38) The requirement of three years' notice for amendments has been waived, up to now, by unanimous consent of the provinces.

While the committee's deliberations lasted until February 1965, they produced only minor amendments to the bill as approved in principle. The government, as well as the Committee, proposed some amendments at the third reading stage, but only in three areas were changes incorporated:

- the RCMP and Armed Forces were included in coverage;
- provisions for orphans' benefits were extended to the children of disabled contributors;
- the committee had recommended an increase from 10 to 20 per cent in the low-earnings months to be dropped from benefit calculation. The government amended this to 15 per cent and it was approved in this form.(39)

Passage and Implementation

On March 29, 1965 Bill C-136 passed third reading and received Royal Assent on April 3 at the end of the parliamentary session. Con-

tributions began in January, 1966 using as a mechanism for deducting and recording earnings the Social Insurance Numbers that had been established for the Unemployment Insurance Commission. As can be seen from the record of the debates on CPP, the Social Insurance Numbers themselves received more attention than many other CPP provisions.

The Quebec Pension Plan became effective at the same time as the CPP. The first retirement pensions became payable in 1967, survivors' benefits in 1968, and disability pensions in 1970. Until 1973 the CPP remained unchanged.

THE RECENT PAST

The first indication of possible changes in the act came in the federal government's White Paper on Income Security at the end of 1970. One major proposal was for an increase in the earnings ceiling.(40) Because of the 2 per cent maximum escalation in the Pension Index, the Year's Maximum Pensionable Earnings (YMPE) figure was rising by only \$100 per year. Both inflation and the general growth in wages and salaries had far outstripped the YMPE, which therefore no longer represented average earnings. The White Paper recommended new ceilings of \$6,300 in 1973, \$7,100 in 1974, and \$7,800 in 1975; under the existing system the 1975 figure would have been only \$5,800. Under the amending provisions of the CPP no remedy could take effect before 1973. The White Paper proposal was however, overtaken by events.

Unilateral QPP Changes

Quebec had long argued that the Government of Canada should vacate the welfare field in that province, including both universal and income-tested pensions. The failure to achieve agreement in matters of social security led to the rejection by Quebec of the constitutional amendment proposal at the Victoria conference in 1971. At the time Quebec was preparing a massive restructuring of social welfare programs in line with the Castonguay-Nepveu report on health and social welfare.(41) After the meetings in Victoria, Quebec amended the QPP to increase the maximum Pension Index escalation from 2 per cent to 3 per cent annually, raise the YMPE gradually from \$5,600 to \$6,300 by 1975, increase the flat-rate component for survivor and disability benefits, and liberalize the retirement test. From this point on the Canada and Quebec plans lacked the parallelism that had resulted from the 1964 compromise.

In the spring of 1973 the federal government tabled its "Working Paper on Social Security in Canada"(42) calling for a federal-provincial review of the patchwork quilt of social programs that had developed. In a section on the Canada Pension Plan, the working paper asked:

- "(a) should the ceiling on the escalation of CPP pensions be removed or alternatively raised from 2 to 3 per cent as the Province of Quebec has done in the Quebec Pension Plan?
- (b) should the year's maximum pensionable earnings...be increased, either in line with the Quebec increase...or to the levels proposed in the Government of Canada's 1970 White Paper?

"For its part the Government of Canada would favour full escalation of pension benefits, and the increase of the year's maximum pensionable earnings to \$7,800 by 1975."(43)

CPP Amendments, 1973-1974

Agreement with the provinces was quickly reached on the most urgent amendments to be enacted, and the act amending the CPP received Royal Assent on December 12, 1973.(44) By unanimous agreement the waiting period was waived by the provinces so that the provisions could take effect at the beginning of 1974. The following changes were made:

- The 2 per cent ceiling on the Pension Index was removed, allowing benefits to escalate fully for increases in the Consumer Price Index.
- The calculation period for indexing was moved from the year ending June 30 to the year ending October 31, thereby making benefit adjustments (January of each year) more responsive to price increases.
- The YMPE was raised to \$6,600 in 1974 and \$7,400 in 1975, with a corresponding increase in the YBE to \$700 (\$900 for the self-employed).
- The flat-rate benefit component was escalated;
- The Pension Index limitation was removed for survivor and disability pensions.

QPP-CPP Co-ordination

At this time Quebec agreed to modify its plan in harmony, and once again the two plans were on the way to restoring their prior parallelism.

The second stage of the amendments followed a year later, with the act receiving Royal Assent on November 27, 1974.(45) This time the major provisions were as follows:

- The YMPE was escalated, beginning in 1976, by 12-1/2 per cent per annum until it reaches the Industrial Composite of wages and salaries; at that time it will be increased in line with that measurement.
- The YBE was lowered from 12 per cent of the YMPE to 10 per cent, and the higher minimum for the self-employed was eliminated.
- The retirement test was removed, making benefits payable between 65 and 70 without regard to outside earnings.
- Surviving spouse benefits were made available to men on the same basis as they were previously paid to women.
- Allowance was made for common-law marriages.
- Members of religious sects were permitted to elect not to contribute on self-employment earnings if their religion so required.

In their major thrust, the amendments reflected a society that had changed since the inception of the plan: wages had grown more rapidly than the YMPE, so that it no longer represented average earnings; women had entered the work-force in increasing numbers and were demanding equality of treatment in fringe benefits; and the earnings test for people retiring at the commonly accepted retirement age of 65 was no longer tolerable. Similar amendments were made to the Quebec Pension Plan, except that the retirement test was not removed until 1977. The major features of the QPP that differed from the CPP at this juncture (and remain today) were the higher flat-rate component of the benefit for survivors under 65 and disability pensioners, and a lower benefit for dependent children.

Recent Changes; Child-rearing Dropout Proposal

A final set of amendments to the legislation received Royal Assent on July 14, 1977.(46) Again, the three-year waiting period was waived by unanimous consent; but one provision of the legislation has not been proclaimed because the required approval by two-thirds of the provinces having two-thirds of the affected population was not forthcoming. The exception is the child-rearing dropout provision, under which persons leaving the labour force to care for their young children could drop certain years from the calculation of their eventual benefit. Ontario withheld consent, thereby effectively vetoing the measure - although British Columbia later reversed its position and voted against the proposal. Should Ontario reverse its position, the amendment could still take effect. Quebec incorporated a child-rearing dropout provision in its own plan; hence the CPP and QPP at present differ in a potentially significant respect.

Amendments approved by the provinces provided for: splitting of pension credits between spouses in the case of termination of marriage; a longer period of backdating pension payments in cases of late application; full children's benefits to each child regardless of family size (instead of half the regular rate for the fifth and additional children.)

Changes since the passage of the original Act in 1965, while moving the plan forward in line with changing conditions and attitudes, have not altered the plan's direction fundamentally. In fact, changes between the White Paper in 1963 and the final plan in 1966 were far greater than any changes since then.

Funding: Still an Issue

In one major aspect - funding - the CPP has yet to find its ultimate form. We have seen how the original intention of a pay-as-you-go plan with low contributions yielded to provincial pressure for a degree of funding as a source of low-cost investment funds. Decisions to be faced in the next few years centre on the type of plan desired and the mechanism for arriving at it. Some critics of the plan claim that it is going bankrupt and that the government is not aware of the problem. For example when the Auditor General of Canada made mention in his 1977 report(47) that the critical year for the CPP fund was approaching, there was a wave of anxious comment from the press and the pension industry. In fact, however, to foresee a funding "crisis" is to ignore the intentions of the framers of CPP, as explained in the original debate.

On more than one occasion the Minister of National Health and Welfare stated explicitly that, after some 10 to 20 years of operation, the CPP contribution level would have to be revised, regardless of the funding method:

June 18, 1963 - "The relation of benefits to earnings will settle out in a way that makes it safe to estimate that for the first 10 years the contribution rate will not need to be more than 2 per cent of earnings."(48)

March 17, 1964 - "This initial low rate will continue in force for 15 years, followed by a gradual increase over the years."(49)

November 16, 1964 - "The combined contribution rate of 3.6 per cent...is proposed as a rate that can be expected to finance the plan for at least 20 years, without liquidating any of the investment reserve that will be built up meantime. All the actuary's estimates indicate...that some time after the plan is 20 years old there will be a need to reassess its finances. By that time experience of the plan will have made possible considerably more precise estimates of its costs. The range of population and

economic projections is too wide for it to be realistic to try to anticipate now what should be decided more than a generation hence. The timing of any change will, of course, depend in part on the views that are then taken about the desirability of continued partial funding and about many other points of economic policy."
(50)

During debate on third reading of the bill, the Minister of National Revenue stated:

"...at some stage, say in about 20 years, one may have to face a diminishing fund or the alternative of increasing the rates."(51)

Funding methods have figured in some subsequent discussions between the federal and provincial governments; Ontario's position was made public on April 1, 1976.(52) To date however, no decision has been reached. This Commission's studies on the subject may be found later in this volume, with its recommendations for future action.

NOTES

- (1) Speech from the Throne, 1st Session, 26th Parliament, May 16, 1963. House of Commons Debates, p. 7.
- (2) For a discussion of the political background to the formation of Canada's earnings-related scheme see Kenneth Bryden, Old Age Pensions and Policy-Making in Canada, Chapter 7, p. 137 ff.
- (3) Ibid., p. 130.
- (4) Ibid., p. 141.
- (5) Ibid.
- (6) Ontario indicated on April 6, 1962 that it had no objection to such an amendment.
- (7) See "Letter to Provinces Respecting Pensions," appended to House of Commons Debates 1963, p. 1576: "The absence of vesting of employer contributions interferes with labour mobility. The lack of assurance that contributions are set aside for future retirement, when an employee leaves a firm, tends to weaken the effect of such schemes in making adequate provision for retirement benefits. The solvency of private pension plans also continues to be a concern."
- (8) "An Act to provide for the extension, improvement and solvency of pension plans and for the portability of pension benefits," introduced March 19, 1963.
- (9) The Ralliement des créditistes argued against "taxing" for pensions and would have expanded the universal flat-rate plan rather than creating a new one.
- (10) House of Commons Debates 1963, p. 1419.
- (11) Bryden, p. 149.
- (12) Speech by the Minister of National Health and Welfare, House of Commons Debates 1963, p. 2340 ff.
- (13) Ibid.
- (14) Ibid.
- (15) Ibid.
- (16) Ibid.
- (17) Ibid.
- (18) Stanley Knowles (Winnipeg North Centre) in House of Commons Debates 1963, p. 2380.
- (19) House of Commons Debates 1963, p. 4166.
- (20) Ibid., p. 4164.
- (21) Bryden, p. 162.

- (22) House of Commons Debates 1963, p. 5444.
- (23) Ibid., p. 5871.
- (24) Speech from the Throne, Second Session, 26th Parliament, House of Commons Debates 1964, p. 3.
- (25) House of Commons Debates 1964, p. 55ff.
- (26) Ibid.
- (27) Bryden, pp. 167-8.
- (28) Communique of the Federal-Provincial Conference, Quebec City, March 31 - April 2, 1964. Appended to House of Commons Debates 1964, p. 1787.
- (29) Premier of Ontario, Speech to the Canadian Club, Toronto, April 8, 1964, p. 11.
- (30) See letter to the provincial premiers, April 16, 1964; appended to House of Commons Debates 1964, p. 2388.
- (31) Debates of the Legislature of Ontario, 1964 pp. 2222, 2224.
- (32) See for example Bryden, p. 174.
- (33) Canada Pension Plan: Report for the year ending March 31, 1976, p. 11.
- (34) "Address Requesting Amendment to Provide for Survivors' and Disability Benefits." House of Commons Debates 1964, p. 4435. The revised text read as follows: "The parliament of Canada may make laws in relation to old age pensions and supplementary benefits, including survivors, and disability benefits irrespective of age, but no such law shall affect the operation of any law present or future of a provincial legislature in relation to any such matter."
- (35) House of Commons Debates 1964, p. 6579.
- (36) Ibid., p. 9507. The new wording of the motion read: "That it is expedient to introduce a measure, to be known as the Canada Pension Plan, to establish in Canada a comprehensive program of retirement pensions payable to contributors; to provide for the payment of supplementary benefits, including benefits for the widows and orphans of contributors and benefits to contributors who become disabled; to provide for the co-ordination of pensions payable under the Old Age Security Act with benefits payable under the Canada Pension Plan and for the payment of adjusted pensions under the Old Age Security Act beginning at any age from 65 years; to provide for the adjustment of pensions and other benefits in line with increases in earnings and the cost of living; to provide that funds arising from the operation of the Canada Pension Plan shall be invested in securities of the provinces, provincially guaranteed securities of provincial crown agents, and securities of Canada; and to provide further that all expenditures under the Canada Pension Plan, including cost of administration, shall be

financed from contributions by employees and employers and from contributions by persons in respect of self-employed earnings."

- (37) See House of Commons Debates 1964, p. 10133. Also see Globe and Mail editorial, "Notes from the Overlord," July 15, 1977, criticizing the federal government for amending its own legislation in the face of Ontario's veto; and reply by the Hon. Marc Lalonde, Globe and Mail, July 20, 1977.
- (38) The matter is discussed in a background paper.
- (39) For a discussion of the background to this amendment see "A Report to the Honourable Marc Lalonde, Minister of National Health and Welfare from the Canada Pension Plan Advisory Committee on Categorical Drop-out under CPP for Child-Rearing," May 1977, p. 3 ff.
- (40) There was also a proposal to increase the flat-rate component for survivor and disability benefits. The White Paper was tabled on November 30, 1970.
- (41) Commission of Inquiry on Health and Social Welfare, Quebec Official Publisher, 1971.
- (42) The paper was tabled on April 18, 1973.
- (43) The Hon. Marc Lalonde, "Working Paper on Social Security in Canada," Department of National Health and Welfare, Ottawa, p. 27.
- (44) An Act to amend the Canada Pension Plan, (No. 2), S.C. 1973-74, c. 41.
- (45) An Act to amend the Canada Pension Plan, S.C. 1974-75-76, c. 4.
- (46) An Act to amend the Canada Pension Plan, S.C. 1976-77, c. 36.
- (47) Report of the Auditor General of Canada to the House of Commons, for the fiscal year ended March 31, 1977, p. 228, para. 17.6.
- (48) House of Commons Debates 1963, p. 2340 ff.
- (49) House of Commons Debates 1964, p. 1161 ff.
- (50) Ibid., p. 10119 ff.
- (51) House of Commons Debates 1965, p. 11919.
- (52) The Hon. W. Darcy McKeough, "Review of Issues in Financing the Canada Pension Plan," Ministry of Treasury, Economics and Intergovernmental Affairs, Toronto, April 1976. See also Geoffrey N. Calvert, Pensions and Survival - The Coming Crisis of Money and Retirement, A Financial Post Book, p. 95.

CHRONOLOGY OF HISTORICAL DEVELOPMENT

February 1958	Government of Canada commissioned Professor R.M. Clark to study the Canadian and U.S. public pension systems.
January 17, 1962	Prime Minister sought provincial agreement for an amendment to Section 94A of the British North America Act to allow inclusion of survivor benefits in a contributory, wage-related pension plan. Quebec withheld approval.
April 6, 1962	Pension Benefits Act introduced in Ontario, "for study and discussion only."
March 19, 1963	"An Act to provide for the extension, improvement and solvency of pension plans and for the portability of pension benefits" introduced in Ontario. Passed April 26, 1963.
May 16, 1963	Speech from the Throne, 1st Session of the 26th Parliament announced "a comprehensive system of contributory pensions."
May 21, 1963	Premier of Quebec revealed that the province was considering legislation similar to Ontario's, on portable pensions.
June 21, 1963	Minister of National Health and Welfare introduced a resolution in the House of Commons on the Canada Pension Plan. Motion agreed to. Prime Minister wrote to provincial premiers, enclosing the resolution and suggesting a federal-provincial conference to deal with pensions.
July 18, 1963	Minister of National Health and Welfare tabled White Paper; debated by Committee of the whole House.
July 26, 27, 1963	Federal-provincial conference discussed pensions.
September 9, 10, 1963	Further federal-provincial conference established a technical committee to find common ground between the proposed Canada Pension Plan and Ontario's Pension Benefits Act, which mandated provincially-portable pensions for employers with 15 or more employees.

January 11, 1964	Prime Minister wrote to premiers to outline revised proposal.
February 18, 1964	Speech from the Throne, Second Session, promised legislation "to establish a comprehensive system of contributory pensions." Prime Minister outlined amended form during Throne Speech debate, February 20. Ontario expressed some concern with new measure.
March 11, 1964	Minister of National Health and Welfare reintroduced a motion dealing with the pension plan, and debate opened March 17 (Bill C-75).
March 31- April 2, 1964	Federal-provincial conference in Quebec City, where the Quebec government outlined proposals for its plan which would be portable with the Canada Pension Plan.
April 16, 1964	Prime Minister wrote to premiers to announce that it had been possible to reconcile the Canada and Quebec plans.
April 20, 1964	Prime Minister tabled his letter to the provinces. Premier of Ontario announced that most of Ontario's concerns had been answered, and his government therefore would amend the Pension Benefits Act to remove the mandatory pension plan provisions. This amendment was passed on May 7.
June 18, 1964	Parliament approved a joint address to Westminster to amend Section 94A of the British North America Act to allow for the provision of survivors' and disability benefits in federal legislation.
August 10 1964	Minister of National Health and Welfare tabled a further White Paper on the Canada Pension Plan.
October 28, 1964	Amended motion by Minister of National Health and Welfare, reflecting discussions with the provinces.
November 9, 1964	Bill C-136 introduced. Received second reading on November 18; referred to joint committee.
February 22, 1965	Debate on third reading of C-136 as amended by the joint committee.
March 1965	Provincial agreement received for constitutional amendment.

March 29, 1965	Bill C-136 passed; received Royal Assent April 3, 1965.
January 1966	CPP and QPP contributions began.
January 1967	First retirement pensions payable.
February 1968	First survivors' benefits payable.
February 1970	First disability benefits payable.
December 1973	Pension Index ceiling removed; benefits would rise in January of each year for full increases in the Consumer Price Index. YMPE raised to \$6,600 for 1974 and \$7,400 for 1975. Increase in flat-rate component.
November 1974	YMPE for 1976 and later to escalate at 12.5 per cent per year until it reaches the Average Industrial Wage. Basic exemption (YBE) reduced to 10 per cent of YMPE from 12 per cent. YBE for self-employed same as for employees. Retirement and earnings test removed: full benefits payable from age 65. Sex discrimination in ancillary benefits removed: spouses and children of female contributors treated the same as those of male contributors. Common-law marriage recognized. Members of certain religious sects permitted to opt out if self-employed.
July 1977	Credit splitting upon termination of marriage introduced. Dropout provision approved but not proclaimed. Limitation on orphans' benefit for fifth and later children repealed.

TABLE OF PROVISIONS AND AMENDMENTS (Part 1)
Canada Pension Plan: Highlights of Development, 1963 to 1965, and Current Provisions

	White Paper July 18, 1963	Bill C-75 March 17, 1964	Quebec Proposals March - April, 1964
Coverage	Compulsory for employees; voluntary for self-employed. RCMP and armed forces excluded.	No change.	Compulsory for employees and self-employed earning over basic amount.
Funding method	Pay-as-you-go; minimal contributions.	Higher contributions ceiling creating initial surplus fund; half to be available for provincial investment.	Contribution rate twice the Ottawa figure, creating much larger initial surplus fund; all monies for Quebec investment.
Contribution rate	1% employee, 1% employer up to earnings ceiling.	No change.	2% of earnings between basic amount and ceiling.
Earnings limits	No basic level; maximum \$4,000 per year subject to annual adjustment in line with wages and salaries.	No basic level; maximum \$4,500 per year subject to adjustment after 5 years for earnings index.	Basic level \$1,000; maximum \$6,000 for two years, then adjusted to Consumer Price Index.
Retirement age	70; permanently reduced pension 65-69. Contributions permitted after age 65.	70; retirement test 65-69 (age reducing progressively from 70). Contributions permitted after age 65.	70; retirement test 65-69. No contributions after age 65.
Rate of benefit	30% average adjusted earnings at age 70, down to 20% at age 65.	20% average adjusted earnings.	25% average adjusted earnings.
Ancillary benefits	Surviving spouse pension at age 65 (male and female).	No change.	Survivor, death, and disability benefits.
Dropout provision	Low earnings years (unspecified number); substitute years after 65 for prior low-earnings years.	10% of total months; substitute earnings after 65 for prior low-earnings periods.	Ascending scale based on age.
Indexing of benefits	None.	None.	Adjusted periodically to Consumer Price Index 1% minimum, 2% maximum.

TABLE OF PROVISIONS AND AMENDMENTS (Part 2)
Canada Pension Plan: Highlights of Development, 1963 to 1965, and Current Provisions

	Bill C-136 November 9, 1964	Royal Assent April 3, 1965	Current Provisions (1979)
Coverage	Compulsory for employees and self-employed earning over a certain basic amount. RCMP and armed forces excluded.	Same, but amended to include RCMP and armed forces.	Same, but self-employed members of religious sects permitted to opt out.
Funding method	Compromise in contribution rate creates larger fund than originally planned; major portion available for provincial investment.	No change.	No change.
Contribution rate	1.8% employee, 1.8% employer; 3.6% self-employed between basic amount and ceiling.	No change.	No change.
Earnings limits	Basic level \$600 (employees) \$800 (self-employed); maximum \$5,000 per year adjusted to pension index from 1968 on; 2% maximum.	No change.	Basic level same for all contributors; linked to maximum. Maximum escalating at 12-1/2% annually (1976 and later) to AIW level, then in line with AIW. No "cap" on annual escalation.
Retirement age	70; retirement test 65-69 (age reducing progressively from 70). Contributions permitted after age 65.	No change.	No change.
Rate of benefit	25% average adjusted earnings.	No change.	No change.
Ancillary benefits	Survivor, death, and disability benefits; pensions to widows and disabled widowers based on age, presence of children. Orphans' benefits reduced for 5th and additional children.	Same, but amended to provide benefits to disabled contributors' children	Benefit structure unchanged; now available to survivors of female plan members on same basis as males. Same benefit payable to all children regardless of number.
Dropout provision	10% of total months; substitute earnings after 65 for prior low-earnings periods.	15% of total months; substitute earnings after 65 for prior low-earnings periods.	Same; (categorical drop-out for child-raising enacted but not proclaimed since Ontario and B.C. have not agreed to the amendment.)
Indexing of benefits	Annual adjustment to pension index - 2% maximum.	No change.	Annual, full Consumer Price Index.

Chapter 2

Summary of Plan Features

Canada Pension Plan benefits are earnings-related, are payable as monthly retirement pensions at age 65, and are based on required contributions of employees, employers, and the self-employed. Benefits are also provided for disabled contributors, surviving spouses, and dependent children; and a lump-sum benefit is payable on the death of a contributor. All monthly benefits are adjusted annually according to increases in the Consumer Price Index.

Pension credits under the plan are fully portable throughout the individual's working life, and are updated to reflect increases in general wage and salary levels.

A CPP contributor retiring in 1979 could receive a pension of up to \$218.06 a month, depending on average earnings. A disability pensioner could receive a maximum of \$216.06, and a surviving widow or widower up to \$134.28. The dependent child of a disabled or deceased contributor was entitled to a flat-rate monthly benefit of \$52.51. The maximum death benefit in 1979 was a one-time payment of \$1,170.

While any province may elect to establish its own earnings-related pension plan, only Quebec has done so. Terms of the Canada and Quebec plans are similar, however, and full portability between them is maintained. Benefits under both plans are payable anywhere in the world.

Coverage is virtually universal for members of the work-force between ages 18 and 65, and extends to those over 65 but under 70 who defer their retirement. Generally, all employees, employers, and self-employed persons are required to make regular contributions on all eligible earnings - through payroll deductions where possible, otherwise through the income tax mechanism.(1)

Eligible earnings are defined as all income from employment or self-employment above a specified minimum and up to a specified maximum. For 1979 the basic exemption (YBE) was \$1,100 and the earnings maximum (YMPE) \$11,700, so that a person's eligible earnings could be as high as \$10,600. Contribution rates (unchanged since the CPP was instituted) are 1.8 per cent for employees and an equal amount from their employers, and 3.6 per cent for the self-employed. Thus, for individuals with earnings at or above the YMPE in 1979, contributions on an annual basis amounted to \$190.80, or \$381.60 if self-employed.

Portability is ensured through the central recording of all contributions in individual accounts. In effect, a single contribution is sufficient to entitle a person to an eventual retirement benefit. Vesting is immediate since no minimum period of service or continuity of employment in a particular location or occupation is required. Portability is further enhanced through the operation of an updating formula at the time benefits are calculated, so that pension credits once earned retain their value in relation to the rising levels of wages and salaries.

Retirement pensions are equal to 25 per cent of pensionable earnings (all earnings up to the YMPE, disregarding the basic exemption) averaged over the number of months the individual could have contributed, that is, from January 1966 or the person's 18th birthday if later. Before the 25 per cent is applied, however, both earnings and contributory months are subject to adjustment - first, to restate the individuals's earnings in terms of current wage levels, and second, to eliminate from averaging certain months of low earnings.

Pensionable earnings for each month of the person's contributions are updated by means of a ratio of the average YMPE for the latest three years (including the year the pension is to commence) to the YMPE in effect at the time of the contributions. Thus, for example, a person whose earnings had been consistently at 75 per cent of the YMPE could expect a pension equal to 75 per cent of the maximum benefit in the year of retirement. The YMPE, it should be noted, is intended to represent an average of industrial earnings. At present it is somewhat lower, and for that reason is increased by 12-1/2 per cent annually; eventually it will be escalated according to increases in average wages and salaries as measured by Statistics Canada (the "Industrial Composite").(2)

Contributory months may be adjusted in three ways. First, the person's contributory period is automatically reduced by any months for which a CPP disability pension was payable. Then contribution months before age 65 may be dropped out according to the number of contribution months after that age. Finally, the remaining months may be reduced by 15 per cent, provided that the balance used in averaging must be at least 120 months.(3) This last "dropout" allowance, which may be as much as seven years, recognizes as a normal characteristic of careers various breaks in work-force activity associated with education,

retraining, illnesses, unemployment, and child-bearing. (A specific allowance for years of child-rearing has been enacted but not yet proclaimed, as discussed in Chapter 8).

Transitional aspects of the CPP during its first ten years of operation affected the retirement rights and benefit amounts of many members of the present over-65 population. First, the eligibility age for retirement originally was 68, reducing to age 65 by 1970. More important to the present discussion, however, is the fact that retirement pensions commencing before 1976 were effectively reduced in all cases. Because they were averaged over a minimum of 120 months, no one could receive full credit for pensionable earnings until contributions had been made for at least 120 months; that point could be reached at the earliest by someone who had contributed regularly from January 1966 through December 1975. Those who chose to take a retirement pension during this transition period (or who reached age 70 and had no choice) received fractional pensions: one-tenth of the full amount if one year's contributions had been made, five-tenths after five years, and so on. No such reduction, however, was applicable to disability, survivor, or dependent children's benefits, although these benefits required contributions for a minimum of from three to five years, and so were not payable in the early years of the plan. The phasing-in of various benefits, especially the retirement pension, was complete by January of 1976; at that time the plan was said to have "matured."

Surviving spouses' pensions are pertinent to a consideration of elderly person's incomes, since many spouses in the present over-65 population, especially women, will have little or no CPP entitlement in their own right. Eligibility for a surviving spouse's pension depends on contributions for ten years, or for one-third of the years in which contributions could have been made, subject to a minimum of three years. The benefit for a survivor between ages 45 and 65 is a flat-rate amount (\$52.51 in 1979) plus 37.5 per cent of the amount of retirement pension the contributor would have received if age 65 had been attained. The same amount applies while a survivor under age 45 has dependent children or is disabled; otherwise there is a reduction of 1/120 for each month the survivor was under 45 at the time of the contributor's death. No benefit, except for the lump-sum death benefit which applies in any case, is payable if the surviving spouse is under age 35 and is neither disabled nor has dependent children; but a full benefit may be payable in the event of subsequent disability. Each child, while a dependent, is entitled to a monthly benefit equal to the flat-rate portion of other ancillary benefits: \$52.51 in 1979. The maximum monthly pension for a surviving spouse under 65 was \$134.28 in 1979 (not counting children's benefits).

Survivors aged 65 or over receive a somewhat lower amount, normally 60 per cent of the deceased person's retirement pension. If the survivor has a CPP pension in his or her own right, however, a combined pension may be payable up to a total equal to the applicable maximum

retirement pension, \$218.06 in 1979. Assuming no personal retirement pension, the maximum payable in 1979 to a surviving spouse aged 65 and over was \$130.84.

Division of pension credits or "credit-splitting" is a relatively new feature of the CPP. On termination of a marriage in 1978 and later, either spouse may apply within three years for an equal division of CPP credits earned by both persons during the period of the marriage.(4) The process includes disclosure to both parties of "pensionable earnings" credited to them before and after the division, and a thirty-day period during which the applicant may withdraw if he or she wishes to do so. Where such a division is made, one spouse will usually have gained a measure of CPP protection for such contingencies as disability, death, and retirement.

Other CPP features include disability pensions and death benefits, both described elsewhere. All benefits are treated as income for tax purposes, and are considered to be "other income" in determining the amount of benefits under income-tested programs - Guaranteed Income Supplement, Spouse's Allowance, and GAINS.

Issues have arisen over some aspects of the benefit features of the plan. These are discussed in Chapter 8.

Table 1
CPP Statistics

<u>1. Number of Recipients in Ontario, June 1979</u>		
Retirement benefits		347,113
Disability pensions		42,711
Children's benefits - under 18		14,448
- 18 and over		3,416
Lump-sum death benefit		2,042
Surviving spouse pension		95,176
Orphan's benefits - under 18		38,193
- 18 and over		10,668
Combined pensions		14,384
Total		568,151
<u>2. Amount of New Benefits Payable in Ontario, June 1979</u>		
		Ontario
	Maximum	Average
Retirement benefits	\$ 218.06	\$159.97
Disability pensions	216.06	182.88
Children's benefits	52.51	52.51
Lump-sum death benefit	1,170.00	926.92
Surviving spouse pension	134.28	112.39
Orphan's benefits	52.51	52.51
Combined pensions	218.06	151.62
<u>3. Benefit Payments in Ontario, June 1979, (\$'000)</u>		
Retirement pensions		\$40,233.3
Disability pensions		8,444.6
Children's benefits - under 18		924.9
- 18 and over		246.7
Lump-sum death benefits		1,892.8
Surviving spouse pension		10,945.8
Orphan's benefits - under 18		2,097.9
- 18 and over		656.4
Combined pensions		2,150.4
Total		67,592.7
<u>4. Benefits as Per cent of GNP (Fiscal year ending March 31, 1978)</u>		
Canada - .48 per cent		Ontario - .26 per cent
<u>5. Benefits as Per cent of Federal Expenditures (Fiscal year ending March 31, 1978)</u>		
Canada - 2.3 per cent		Ontario - 1.3 per cent
<u>6. Contributions (1978-79)</u>		
Canada - \$2.1 billion		Ontario - not available
<u>7. Individual Maximum Contribution (1979)</u>		
Employee - \$190.80		Self-employed - \$381.60
<u>8. Earnings Ceiling; Basic Exemption (1979)</u>		
YMPE - \$11,700		YBE - \$1,100

Source Canada Pension Plan, Statistical Bulletin, Special Edition 1979; additional data from Department of National Health and Welfare, Department of Finance.

NOTES

- (1) Certain individuals may be excluded because of religious convictions against joining such a plan. They may rejoin after opting out, but once back in the option to leave again is no longer applicable.
- (2) Based on data provided by Statistics Canada: monthly averages of weekly industrial composite wages and salaries, 1978 (including preliminary figures for November and December). Average weekly wages and salaries: \$265.38; annual average: \$13,799.76; 1978 YMPE was \$10,400.
- (3) Applicable to persons retiring in January, 1976 and later. For retirements during the transition period (1967 through 1975) benefits were effectively reduced by the requirement that "basic contributory months" must total at least 120. Thus, a person who has contributed throughout 1966 and retired in January, 1967 would have been entitled to 12/120 of the 25 per cent, or 2.5 per cent of pensionable earnings.
- (4) Section 53.2 of the Canada Pension Plan Act (S.C. 1976-77, c. 36, s.7) reads:

"An application in writing to the Minister may be made by or on behalf of either former spouse to a marriage or his estate or such person as may be prescribed by regulation within 36 months of the date of a decree absolute of divorce or of a judgment of nullity of the marriage, granted or rendered on or after January 1, 1978, for a division of the unadjusted pensionable earnings of the former spouse."

Chapter 3

Demography

Demography attempts to identify population trends and make projections for the future, based on a statistical study of births, deaths, and migration. Only time can verify demographic projections; but they must be made if successive generations are to plan intelligently for the future. Just how uncertain that future can be is illustrated by the following extract from Leonard Marsh's report, written in 1943, on social security for Canada:

"The indications are that if the birth rate continues to decline and our working-population deficiency is not supplemented by immigration, the result will be fewer and fewer people of working age being obliged to carry, in one way or another, the burden of support for more and more persons who have passed the span of useful employment. The problem is not therefore one that can be disregarded or tossed lightly aside. Even if we do nothing at all, the fact will still face us that thirty years from now our old age pension bill will be approximately twice what it is to-day."(1)

In 1943, the author would have rejected out of hand the possibility of a baby boom in the proportions experienced by Canada after 1945.

Until the advent of government programs redistributing income to the aged (the 1927 Old Age Pensions Act was the first) the make-up of the population was not a concern to the public purse. The aged in general were expected to die before retirement or to provide for themselves or be provided for by their children in their later years. As it happened, Canada was a growing country whose birth rate produced a year-by-year increase in the population. The total fertility rate exploded after 1945 to an average high of 3 per cent and then in the 1960s the birth rate began to decline, to a rate at which today the population is no longer replacing itself. Now Canada is faced with the

questions: Will the birth rate follow the pattern of the European industrialized countries and leave us with an aging population? What will be the effect of an aging population on Canada's social security programs?

Geoffrey Calvert in "Pensions and Survival" (1977) drew a gloomy picture for Canada's social security based on the effects of a continuing decline in the birth rate:

"...one can watch the tidal wave of today's young people entering the work-force, sweeping up through it, and then entering the retirement ages, radically changing the whole balance between young and old, and between workers and pensioners at each stage of their forward surge through the age groups.(2)

"The source of our concern does not stem only from the swollen cohorts of population now entering the work-force, but equally from the shrunken cohorts that will follow them up through the age groups. It is this shrunken generation, also with us today and as yet unborn, that will have to carry the burden of pensions for their more numerous parents and elders, and to face the prospect of tax burdens that would almost certainly be rejected in short order by today's voters."(3)

Calvert's warning has been taken up by the media and has been applied primarily to the future of the Canada Pension Plan. The possible effects on the Old Age Security (OAS) and Guaranteed Income Supplement (GIS) programs also discussed by Calvert have been largely ignored, but they are also important in considering the total cost of social security in the future.

This Royal Commission was charged to "study the impact on the economy of different systems of financing retirement pension plans and arrangements including Ontario's financing and investment role in the Canada Pension Plan."

To obtain a proper perspective of Ontario's role in the Canada Pension Plan it was necessary to look at the interrelation of the CPP with other government programs providing retirement income. Canada's "social security" for the elderly (which we may define as a provision of income in old age, guaranteed or made available by government) is made up of OAS, GIS, Spouse's Allowance, and in Ontario, GAINS, all paid for out of general taxes, and by the Canada Pension Plan, paid for out of payroll taxes shared by employee and employer. All of the plans ultimately rely on the authority of government for their financial security. If the funding arrangements for the CPP are of concern, the financial arrangements of the OAS, GIS, and SA are of no less concern. Therefore when we consider questions of intergenerational inequities and the effect of the baby boom on the CPP we must also consider the OAS, GIS, and Spouse's Allowance and their costs in the future. To determine

these costs it is necessary to estimate what Canada's population and its composition is likely to be between now and the middle of the next century.

POPULATION PROJECTIONS

All projections into the future, whether gloomy or optimistic, are nothing more than guesses based on the likelihood that the future will either mirror the past or diverge from it. The further ahead the projection, the less likely is it to be correct as it moves further away from those conditions, past and present, which affect the future. Caution must therefore be used at all times, and especially for periods more than twenty years away. Projections seventy years into the future (2050) are given merely to show possible trends after the time when the last children of the baby boom have completed the life cycle.

In 1972 the fertility rates for Canada fell below those required to replace the existing population. The population projections from which Calvert drew his conclusions were based on a continuing decline in fertility rates. To test the validity of Calvert's prognosis it was therefore necessary to examine the reasons for assuming this continuing decline and then to look at all the factors affecting population projections. Statistics Canada had also made long-term population projections based on a declining birth rate.

Ultimately the Commission decided to make its own projections. A comparison with the Commission's results and those of Statistics Canada is given in a resource study included in this volume. It illustrates the very different results that arise from differences in assumptions. The accuracy of demographic projections is crucial for social security planning.

Table 1
Projected Population for Canada, Selected Years(a)

	Royal Commission		Statistics Canada			
	Total	65 and	Total	65 and	Total	65 and
	population	over	population	over	population	over
	(Thousands)		(Thousands)			
2000	31,596	3,384				
2001			28,251	3,358	29,758	3,358
2030	38,930	6,712				
2031			28,837	6,406	33,727	6,406
2050	42,126	7,458				
2051			26,090	5,993	33,737	6,241

a Figures are for different years because of the initial starting years selected by the Commission and Statistics Canada.

Source Royal Commission on the Status of Pensions in Ontario.
Statistics Canada, Social Security National Programs, 1978, Cat. 86-201.

The key variables in any population projections are fertility, immigration/emigration, and mortality. Careful consideration was given to each of these by the Commission because the population projections provide the base for all its work related to the Canada Pension Plan, and the future costs of other government programs, including the GAINS program. We examine each of these variables in turn.

Fertility

Fertility(4) dropped below the level of zero population growth for the first time in Canada's history in 1972.(5) Discounting the post-war baby boom of 1945-1965, this drop is in line with the long-term decline in fertility which characterizes most Western countries. In planning for social security the question to be answered is whether Canada (and Ontario) can expect any significant short-term fluctuation in fertility in the near future which will alter the population size and distribution from long-term expectations over the next 70 years. Most commentators have assumed a continuing decline. Daniel Kubat, sociologist to the Commission, represents a school of thought which forecasts a slight upturn in fertility rates over the next two decades, with a return to zero growth by the year 1995. Dr. Kubat based his conclusion on the following observations:

1. Women in the age group 25 to 29 have exceeded women aged 20 to 24 in Age Specific Fertility, beginning in 1970. This points to a postponement rather than to a cessation of childbearing. Figures in Table 2 illustrate the trends for Ontario:

Table 2

Age Specific Fertility Rates for Women 20-24 and 25-29, Ontario, 1966-1976

Year	20 - 24	25 - 29
1966	171.3	160.2
1967	162.7	151.2
1968	155.2	148.8
1969	152.9	152.5
1970	148.5	152.2
1971	137.2	145.9
1972	122.2	138.6
1973	119.8	132.2
1974	114.6	129.4
1975	112.3	128.3
1976	105.6	124.6

Source Statistics Canada, "Vital Statistics, Volume I, Births 1975 and 1976," Cat. 84-204, Table 6, p. 18.

2. The 1976 Census shows the female population in Ontario by age group, as follows:(6)

10-14	389,475
15-19	395,325
20-24	376,095
25-29	359,460

Thus the greater numbers in the younger cohorts will result in more children in absolute terms being born even if the rate of reproduction remains the same. This is the so-called baby boom "echo." However if the present trend of delayed child-bearing continues, it is likely to prevail until about 1990 and will result in more births in the meantime than earlier specific fertility rates would have forecast.

3. There is some indication that the present younger generations are returning to more traditional values than those which prevailed in the 1960s and early 1970s. This could signal a renewed interest in the family. Peer group pressure is an important factor in the lives of the young, and any renewed interest in child-raising could have a snowballing effect because of the size of the age groups concerned.
4. History does not offer any examples of sustained zero growth except as a consequence of dramatic fluctuations in mortality which wiped out substantial populations from time to time. Fertility will fluctuate around a net replacement ratio of 1 and is more likely to be above unity than below it.

Some relief from the continued downward trend in fertility is foreseen by the Commission on Declining School Enrolment in Ontario. In his letter of transmittal to the Minister of Education the chairman offered the following view:

"My best guess, however, and it cannot be more than an informed guess, is that we will experience some relief from the decline in elementary school enrolment from the mid 1980s to the early 1990s and in secondary school enrolment from the mid 1990s onwards for a number of years."(7)

A recent article in Scientific American deals with fertility in the developed countries and accepts the view of a continued downward trend because of social and economic factors which are changing the nature of marriage and fertility.(8) In examining the historical downward trend in fertility, the author admits that some projections of extremely low rates may be too compacted in time frame and, as a consequence, the patterns now being predicted by some for the 1980s and 1990s may be delayed by a few decades.

The author, arguing that we are in a society permanently changed from the old patterns of fertility, lists such contributing factors as

- a) a change from the perception of children as a source of future income in an agrarian society, to the perception of them as a financial burden in the industrial and post-industrial world;
- b) a decline in traditional and religious authority and an increase in emphasis on the individual;
- c) universal education of both sexes and an improvement towards equality in the status of women with men;
- d) higher survival rate of children;
- e) a consumer society slanted toward the gratification of the individual;
- f) development and diffusion of reliable methods of birth control.

He adds:

"The important thing about this catalogue of social changes is that the changes all seem to be irreversible and that some of them, particularly those linked with the status of women, have not yet run their full course."(9)

The Commission is not persuaded that all of the social changes listed are irreversible, as the author suggests. Future changes in our society to be brought about by energy supply problems promise to be far-reaching. Adaptation may bring with it new social outlooks which could also change attitudes towards child-bearing. After considering the arguments the Commission decided to adopt Dr. Kubat's position of a slight upswing in fertility rates in the near term as its most probable assumption for its projections. However, for comparison purposes, a range of fertility assumptions was also selected which included a declining fertility rate. The four scenarios are:

Low-Low - the scenario popular at present sees a continuation of current low net reproduction rates (0.90) to the year 2000 and beyond.

Low - a continuation of the current rate rising slightly to 1.0 in 1985 and continuing at that rate thereafter.

Most Probable - a slight increase from current rates to 1.2 in 1985, dropping to 1.1 in 1990, 1.0 in 1995 and continuing unchanged thereafter.

High - an increase from current rates to 1.45 in 1985, dropping to 1.3 in 1990, 1.15 in 1995, 1.0 in 2000 and continuing unchanged thereafter.

Immigration

Numbers of immigrants and their age and sex distribution can have important effects on Canada's future population. The Commission's projection for international immigration were based on actual experience from 1971 to 1977 inclusive, as shown in Table 3.

Table 3

International Immigration to Canada and Ontario, 1971-1977

	Canada	Ontario	Immigration to Ontario as a share of total (Per cent)
1971	121,900	64,357	52.8
1972	122,006	63,805	52.3
1973	184,200	103,187	56.0
1974	218,465	120,115	55.0
1975	187,881	98,471	52.4
1976	149,429	72,031	48.2
1977	114,914	56,594	49.2

Source Department of Manpower and Immigration, Ottawa, Immigration Statistics.

The Commission assumed for its projections 100,000 immigrants to Canada in 1978, escalated by 1/2 of 1 per cent per year to the year 2000 after which it remains constant. For interprovincial migration, the Commission assumed that Ontario would receive a constant 50 per cent of the international immigration.

Emigration figures are more difficult to ascertain and have been estimated from figures showing immigration to the United States from Canada. The Commission has assumed an annual figure of 40,000 emigrants, 40 per cent of whom are assumed to come from Ontario. These figures, too, are escalated by 1/2 of 1 per cent per year to the year 2000 and remain constant thereafter. For Ontario the net figures resulting from these assumptions were:

1978 net immigration of 60,000
2000 net immigration of 66,960.

An important factor in immigration figures is the age composition of those coming into a country (or province); that is, the proportion of old and young dependents and hence the proportion likely to enter the work-force upon arrival. Until changes in the Immigration Act (1976) there were three classes of admissible immigrants: independent, those

with good employment prospects; sponsored relatives, the immediate family; and nominated relatives, who needed to meet only some of the criteria for independent immigrants in order to gain admission. It has been argued that the last group was largely responsible for the numbers of recent arrivals who had difficulty obtaining work and as a consequence fell back on public support programs.

Changes introduced in 1976 allowed the Minister of Immigration for the first time to set numerical targets for immigration each year. The category of nominated relatives has been dropped. The legislation also allows for inflows of refugees from time to time, stemming from extraordinary circumstances elsewhere. It is likely, therefore, that reunification of families will be an important part of the immigration picture for the coming decade; subsequently however, the needs of the work-force will be the underlying reason for admission and it can be expected that independent persons who can fit directly into the labour force will constitute the major part of the entrants.

Historical tables(10) show that around 50 per cent of all immigrants in any year between 1946 and 1974 could be classified as workers - coming from the independent and nominated classes of immigrants. However the percentage dropped to 43 in 1975 and 41 in 1976, the latter being a year of unprecedented immigration from Lebanon following the civil war. Future patterns should be expected to show similar variations in the proportion of dependent and independent immigrants whenever groups are admitted for humanitarian reasons.

The Commission has made no assumption about the proportion of independent and dependent immigrants, but age and sex breakouts are projected for migrants in Table 4 based on Statistics Canada figures for immigrants(11), and on U.S. information about persons immigrating from Canada, for emigrants. Ratios between the age groups and the sexes are assumed to remain constant throughout the period of the projections.

Table 4
Immigrants and Emigrants by Age Group and Sex, Canada, Projected

	Immigrants		Emigrants	
	Male	Female	Male	Female
	(Per cent)			
Under 20	15.7	15.4	17.6	18.1
20 - 64	33.2	33.2	29.2	32.9
65 and over	0.9	1.6	0.9	1.2
Total	49.9	50.1	47.8	52.2

Source Prepared for the Royal Commission on the Status of Pensions in Ontario by Daniel Kubat, from data from Department of Manpower and Immigration and Statistics Canada.

These projections, therefore, allow for a larger proportion of independent immigrants who can move directly into the work-force, and a decreased proportion of dependents (under age 20, and 65 and over), though still allowing for family reunification and extraordinary influxes on humanitarian grounds.

While the mortality and fertility experience of newcomers is often vastly different in their country of origin, it is found that they quickly adopt the values of the new society. Therefore we cannot expect them to have a crucial impact on the birth rate of the Canadian population. In addition, Canada's immigration screening is such that good health is a criterion for entry, and persons coming to this country tend to be better-off financially and better educated than their countrymen at home. These factors have been shown to correlate positively(12) with lower fertility. As a consequence we should not expect immigration to distort fertility patterns and therefore the general projections for the Canadian population.

There is also little reason to expect that the increasing participation in the labour force of women in Canada will not be matched by immigrant women; indeed one might argue that they are more likely to take jobs than their Canadian counterparts.

The implications of the amended Immigration Act among other factors, coupled with experience in recent years, has led this Commission to assumptions about population movements which produce figures somewhat below those in other current major works.

Mortality

The final factor to be considered in outlining our future population is how long these newborns and recent arrivals as well as the present population will live. For this factor we assumed changes in mortality experience to continue through to the year 2050. The initial population used was that of the 1971 Census, adjusted to allow for the Census undercount, and the mortality rates applied to this population were those of the Life Table 1970-72 for Canada, published by Statistics Canada. Mortality rates were then developed through to the year 2050.

The Commission felt that available Canadian work on mortality projections either covered too short a period or was based on some rather arbitrary assumptions that it was not prepared to accept. Consequently, the methodology used for the Commission's projections is based on work done by the Office of the Actuary for the U.S. Social Security Administration, in Actuarial Study No. 77.(13) In this study death rates by age group and sex were calculated for ten cause of death groupings. The assumed changes in experience for each cause were combined to provide an average change (increase or reduction) in mortality by age and sex. These averages were then applied to the 1971 population figures and projected forward to the year 2050.

The Commission has assumed there will be no major breakthrough in medicine which might alter the experience over the period in question. Other underlying assumptions in some of the cause of death groupings are as follows:

- Diseases of the heart and vascular diseases: moderate improvement is expected for both sexes, continuing the recent trend;
- Malignant neoplasms (cancer): moderate improvement is assumed; heightened public awareness of the disease leading to earlier diagnosis and treatment could result in deaths occurring at a later age even if the rate of death remained unchanged;
- Suicide, homicide, accidents: the death rate from motor vehicle accidents has already decreased; however in Canada suicides are increasing for both sexes. Some overall increase is expected in violent deaths for males;
- Respiratory diseases: some improvement is assumed;
- Diabetes, cirrhosis: assume no change.

It is well known that changes in lifestyle affect health, and that the impact on the sexes can vary. Female mortality experience, in the Commission's assumptions, is expected to improve faster than male, in spite of factors such as diet, ceasing smoking, exercise, and the use of seatbelts, all of which have tended to reduce male mortality in recent years.

The Commission's projected life expectancy figures show that by the year 2050 men are still not expected to reach the rate already attained by women. Projected figures for Canada are assumed to apply to Ontario, and comparisons are shown in Table 5 between actual experience in 1971 and 1976, and the Commission's expected rates in 2050.

Table 5
Life Expectancy by Sex, Canada and Ontario, 1971, 1976, 2050

	1971		1976		2050
	Canada	Ontario	Canada	Ontario	Canada and Ontario
	(Years)				
At birth					
Male	69.3	69.6	70.19	70.55	73.1
Female	76.4	76.8	77.48	77.66	81.2
At age 60					
Male	17.0	16.6	17.23	17.01	-
Female	21.4	21.5	21.96	21.88	-
At age 65					
Male	13.7	n/a	13.95	13.71	16.0
Female	17.5	n/a	18.0	17.92	20.7

Source Statistics Canada, Vital Statistics, Volume III, Deaths 1976, Cat. 84-206, and data prepared for the Royal Commission on the Status of Pensions in Ontario.

Figures for the expected mortality rates per 1,000 population exposed are shown in Table 6 which compares experience in the 1970-72 Life Table for Canada with the projections prepared for the Commission. Rates calculated for Canada are assumed to apply to Ontario.

Table 6

Mortality Rates by Sex, Canada and Ontario, 1971 and 2050

	1971		2050	
	Male	Female	Male	Female
	(Deaths per 1,000 population)			
At birth	20.02	15.44	10.05	7.76
At 1 year	1.29	1.15	.80	.64
At 20 years	1.78	.56	1.89	.44
At 40 years	2.91	1.73	2.40	1.19
At 50 years	7.61	4.03	5.69	2.75
At 60 years	19.71	9.32	14.59	7.12
At 70 years	44.36	23.37	32.51	15.58

Source Department of Insurance, Ottawa. Canada Pension Plan: Statutory Actuarial Report No. 6, as at December 31, 1977, Schedule 3, p. 41.

The projected reduction in mortality at birth has, to a certain extent, already been achieved. The combined male-female rate in 1971 was 17.5 per thousand; by 1976 this had dropped to 12.3.(14) From Table 6 the projected increase in violent deaths for young males can be seen at age 20, where the rate per 1,000 is expected to increase slightly over time. From age 50 onward the gap in mortality between the sexes becomes more pronounced.

Conclusion

Comparison of census figures for 1971 and 1976 confirms that Canada's population is aging, and in the process the trend to increased survivorship of women can already be perceived. Of crucial importance to our assessment therefore is the number of children we expect to be born, and the time of their birth. As they work their way through the pattern of dependence - production - dependence they will have a tremendous impact on the extent of the burden to be carried by the taxpayers.

By combining the projections outlined for fertility, migration and mortality, we estimated the numbers and the composition of the population of Canada and of Ontario over the coming 70 years. Results for selected years for Canada are set out in Table 7. Complete projections including those for Ontario are in Appendix A to this volume.

Table 7
Actual and Projected Population for Canada, 1970-2050, Selected Years

	0 - 19	20 - 64	65 - 90 and over	Total
	(Thousands)			
1970				
Male	4,415	5,716	774	10,905
Female	4,235	5,618	943	10,796
Total	8,650	11,334	1,717	21,701
2000				
Male	5,124	9,172	1,411	15,707
Female	4,860	9,056	1,973	15,889
Total	9,984	18,228	3,384	31,596
2010				
Male	4,900	10,454	1,667	17,021
Female	4,646	10,342	2,306	17,294
Total	9,546	20,796	3,973	34,315
2020				
Male	5,280	10,751	2,258	18,289
Female	5,004	10,587	3,100	18,691
Total	10,284	21,338	5,358	36,980
2030				
Male	5,398	10,954	2,822	19,174
Female	5,115	10,751	3,890	19,756
Total	10,513	21,705	6,712	38,930
2050				
Male	5,713	11,873	3,116	20,702
Female	5,413	11,669	4,342	21,424
Total	11,126	23,542	7,458	42,126

Source Projections prepared for the Royal Commission on the Status of Pensions in Ontario, based on the Commission's most probable fertility and immigration assumptions.

From Table 7 it will be noted that in the year 2000 the total female population exceeds the total male population for the first time. This trend continues to 2050 and reflects the increasing proportion of females in the 65 and over group. This fact has significance for the approach government might take in considering retirement income for women, both in and out of the work-force. The significance of the make-up of the various age groupings in the population projected is considered in the next chapter.

NOTES

- (1) Leonard Marsh, Report on Social Security for Canada, Toronto, 1943.
- (2) Geoffrey N. Calvert, Pensions and Survival, Toronto, 1977 p. 16.
- (3) Ibid., p. 18.
- (4) Definitions of usual fertility terms:
 - A. Zero Population Growth: each female born reproduces one female; this equals a net reproduction rate of 1.
 - B. Net Reproduction Rate (NRR): the probable number of female children each female will have during her lifetime.
 - C. Gross Reproduction Rate (GRR): the probable number of female children each female will have during her lifetime provided she survives the child-bearing years. (Because of this assumption the GRR is always greater than the NRR.)
 - D. Total Fertility: the probable number of children a woman will have provided she survives to the child-bearing years.
 - E. Age-Specific Fertility: the probability that a woman of a particular age group will have a baby within one year. The normal age groups used are 15-19, 20-24,...45-49, and fertility is assumed to be zero outside these ages.
- (5) Statistics Canada, Vital Statistics, Volume I, 1974, Cat. 84-204.
- (6) Statistics Canada, 1976 Census of Canada, Cat. 92-824, Vol. 2.
- (7) Letter to the Hon. Bette Stephenson, M.D., Minister of Education from R.W.B. Jackson, Commissioner, dated October 31, 1978, p. iv.
- (8) Charles F. Westoff, "Marriage and Fertility in the Developed Countries," in Scientific American, December 1978, Vol. 239, Number 6, p. 51.
- (9) See Volume V, Resource Study, "Methodology and Assumptions," Table 1.
- (10) See migration tables in Daniel Kubat, "The Demography of Older Canadians." in Volume IX.
- (11) K.S. Guanasekaran, "Analytical and Technical Memorandum No. 6: Migration Projections for Canada."
- (12) For example, see discussion in "Opportunity for Choice - A Goal for Women in Canada," Gail C.A. Cook, ed., Statistics Canada in association with the C.D. Howe Research Institute, pp. 37ff.
- (13) U.S. Social Security Administration, Actuarial Study No. 77 - United States Population Projections of OASDHI Cost Estimates.
- (14) Figures supplied by Department of National Health and Welfare, Ottawa, Health Services and Promotion Branch.

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Chapter 4

Dependency Ratios

Dependency ratios represent the extent to which part of a country's population at a given time is not engaged in economically productive activity. The unproductive population relies on the productive part to provide it with the goods and services it needs for existence. Traditionally, the young and the old are considered unproductive. Since economic wealth is finite, consisting of the goods and services produced each year, the share of the wealth transferred to the unproductive diminishes the share for the productive. If the unproductive part of the population increases, then by the theory the share of goods and services for the productive part of the population decreases. The relative sizes of the productive and unproductive parts of the population can be important therefore both at any point in time and as trends over time.

Birth rates, mortality rates, education patterns, retirement patterns, and savings rates will all be important factors in determining dependency ratios and the significance of those ratios for government social policy in the future.

The Commission analyzed its population projections on the basis of customary groupings of the population age 0-19, the young dependents; age 20-64, the productive part; and age 65-90 and over, the old dependents. Dependency ratios were then calculated for the projected population based on the percentage of the young dependents to the productive part, the percentage of the old dependents to the productive part, and the total dependents to the productive part. Table 1 shows the results.

Table 1
Population Dependency Ratios for Canada, 1970-2050

	Total population (Thousands)	0-19 as percentage of 20-64	65-69 and over as percentage of 20-64 (Per cent)	Total dependency as percentage of 20-64
1970	21,701	76.3	15.2	91.5
1980	24,872	57.6	15.6	73.2
2000	31,596	54.8	18.6	73.3
2010	34,315	45.9	19.1	65.0
2020	36,980	48.2	25.1	73.0
2030	38,930	48.4	30.9	79.4
2050	42,126	47.3	31.7	78.9

Source Projections prepared for the Royal Commission on the Status of Pensions in Ontario based on the Commission's most probable fertility assumptions. See Appendix A for population projections and Appendix B for Dependency Ratios.

Some interesting relationships should be noted:

- the total dependency ratio in 1970, 91.5 per cent, was higher than it is projected to be at any other time over the next 70 years - each worker was responsible for himself and nearly one other person.
- the total dependency ratio declines markedly between 1970 and 1980, from 91.5 per cent to 73.2 per cent. All of the decrease is in the young dependent ratio. The baby boom population has moved into the 20-64 age grouping.
- the young dependency ratio continues to decline gradually to 2010. After 2010 the young dependents increase somewhat, reflecting an increase in absolute births from the baby boom "echo." After 2030 the downward trend resumes.
- the old dependency ratio increases over the whole period, doubling by 2050 but with the largest increases taking place only after 2010 and up to 2030, the period during which the baby boom population will enter the old dependency group.

Much comment has been heard about the increasing burden old people will put on society by the beginning of the century and in particular on the young workers of that generation. The dependency ratio has been pointed to repeatedly to support the premise that the burden will be so great that younger workers will revolt and refuse to pay for the old.

From the Commission's projections we see that the total dependency ratio is actually at its lowest point in 2010 and that a substantial

upturn is evident only in 2020. The government has therefore over 30 years of lead time before the feared revolt is likely to come. This is not to say that nothing should be done for 30 years but rather that it is not already too late to take action to relieve the pressure on the working population.

In 1970 the country shouldered a total dependency ratio of 91.5 per cent without comment. What then is the difference between 1970 and, say, 2020 when the total dependency ratio is projected at 73 per cent?

Clearly the answer to that question lies in the respective cost for young dependents and old dependents.

EFFECTIVE DEPENDENCY

"Per capita costs of supporting old and young dependents are not necessarily equal. To obtain a more accurate picture of dependency, the number of old and young should be weighted by their respective per capita support costs. In this way a measure of effective dependency is obtained."(1)

The Ontario Treasury, working with a study prepared in 1976 by the Federal Treasury Board Secretariat, estimated that per capita expenditures for government health, education, and social welfare programs for the aged was two and one-half times the per capita expenditures for the young. Although the Commission has not tested the validity of the figures, it was prepared to accept the idea of "effective dependency" because it agreed that public costs for the old were likely more than for the young. However, if age dependency is weighted against youth dependency in the proportion of 2.5 to 1 and applied to ratios in Table 1, we have nearly the same long-term results for effective dependency as we found in the dependency trends shown in Table 1. The total cost relationship will continue to be less than that borne in 1970 until after the year 2020. Only in 2030 does the total cost relationship exceed that for 1970, and by 2050 there is only a slight increase in the total cost relationship over that in 2030.

The validity of these relationships as projected depends first on whether the ratio of 2.5 accurately represents the dependency cost of the old in relation to that of the young. If, for example, there were a marked improvement in the health of the old so that health costs for that segment of the population declined, the total cost burden would diminish, and there would be a shift in the cost relationship between young and old dependents. A similar change might result if costly institutional care for the old were replaced by less expensive home care. If institutional day care for the young were expanded, the cost relationship might shift from old to young. The total cost of dependency could decrease. Improved survivorship rates would increase the numbers of those aged 65 and over. However, improved survivorship

indicates better health which in turn could mean greater participation in the work-force in the older age groups, and a shift of the older cohorts out of the old dependency grouping. Perhaps only the old old (those over 75) eventually will be considered dependent.(2)

Table 2
Effective Dependency Cost Relationships

	Youth cost share Dependency ratio	Age cost share 2.5 x dependency ratio (Per cent)	Total cost ratio
1970	76.3	38.0	114.3
1980	57.6	39.0	96.6
2000	54.8	46.5	101.3
2010	45.9	47.8	93.7
2020	48.2	62.8	111.0
2030	48.4	77.3	125.7
2050	47.3	79.2	126.5

Source The Royal Commission on the Status of Pensions in Ontario, based on dependency ratios in Table 1.

A second element in measuring the validity of the dependency ratio is the relationship of total dependency cost to the total productivity of the society. Therefore, the key to measuring the burden of dependency cost is the real growth rate of the Canadian economy. Increased costs due to population changes can be supported more easily if the economy is strong. If each worker is producing more in real terms (not inflated dollar terms) a certain level of benefits from government programs will take a smaller proportion of the economy's available output. In this connection, pensions under the CPP increase with real growth until retirement since they are tied to a wage index. After retirement they increase with a price index, as do the OAS and GIS, and not with productivity. Hence, government programs for the old will be less of a burden on future generations if we have real economic growth.

To estimate some cost implications of the projected age dependency ratios the Commission undertook a projection of the cost of Old Age Security in the future. Assumptions included the following:

- OAS at its present basic level, increasing only with prices;
- the Commission's most probable economic assumptions for inflation;
- real growth in earnings of 2 per cent a year.

The results were determined in absolute dollars, as a percentage of Gross National Product and as a percentage of CPP/QPP Contributory

Earnings. Complete results are shown in Appendix F. Table 3 shows OAS costs as a share of GNP, the most significant of the three measurements.

Table 3

Old Age Security Expenditures with Full Indexing to the Consumer Price Index as a Percentage of Gross National Product

	Percentage of GNP
1979	1.72
1980	1.71
1990	1.59
2000	1.38
2010	1.17
2020	1.27
2030	1.28
2040	.99
2050	.88

Source The Royal Commission on the Status of Pensions in Ontario. See Appendix F-1.

From these figures we see a similar pattern emerging for costs in relation to GNP as for dependency ratios:

- a steady fall until about 2010;
- a more stable pattern for the 20 years between 2010 and 2030 (though with an increase in cost resulting from the baby boom which is not reflected in the dependency ratios per se);
- a continuing reduction after 2030.

The comparative reduction in expenditures as a percentage of GNP reflects the fact that the benefits are indexed only to prices, and thus increase more slowly than per capita GNP which includes real growth (in excess of prices) of about 2 per cent a year. This factor outweighs the increasing proportion of the population that is 65 and over, except for the period 2010 to 2030 during which the baby boom group reaches retirement age. An even larger comparative cost reduction can be seen for the Guaranteed Income Supplement and Spouse's Allowance, in the comparison set out in Appendix F-4. Similar trends are projected for Ontario in Appendices F-3 and F-6.

VALIDITY OF DEMOGRAPHIC CONCERNS

The concern expressed by Leonard Marsh in the 1940s over an increasing elderly population to be supported by government programs

was perfectly valid from his point in time. He could not predict the post-war baby boom or the economic growth of the country.

The scenario outlined by Geoffrey Calvert for the long-term impact of the baby boom may be equally valid at this time; but the Commission is of the opinion that projections of the population into the future, especially over a period of 70 to 90 years, can at best only point to possibilities which policymakers should consider when making decisions. The Commission affirms the need to design programs now which take cognizance of possible conditions in, say, 30 years' time, with allowance for reconsideration as factors change.

Some of the variables which will affect our demographic future, especially as it relates to pension planning, must not be ignored:

Fertility and Mortality Rates

The baby boom cohorts do not begin to enter retirement till about 2010. An upswing in fertility as late as 1990 could provide sufficient young workers to offset the greater number in the older cohorts. Who can now accurately predict the social patterns of fertility and family creation in 1990? Lower fertility rates or maintenance of present rates are not the only possibilities. The Commission is attracted to the possibility of an upswing of fertility rates in the middle and late 1980s. On the other hand a major medical breakthrough such as a cure for cancer would lead to much longer life expectancies and hence to increased pension cost. Even with known mortality rates we have seen in our projections that women will exceed the number of men in absolute numbers by 1980.(3) The effect of longer life expectancies in the future will therefore have increasing importance for overall retirement income costs. On the other hand, a healthier population at older ages coupled with more flexible retirement ages may mean that people will work for longer periods. In that event there may be reduced costs for pensions and more workers to support the dependent population.

Immigration

Control of immigration has been used from the early part of this century to deal with short-run deficiencies in the population structure. Who can say now what exigencies, such as the expected shortage of skilled labour in the 1980s, will be met in this way? Type and age of immigrants and their social patterns, will have an impact on the existing population and on the population of the future. Disruptions elsewhere in the world, such as the plight of the "boat people," followed by unexpected immigration, can affect the population structure in ways we cannot begin to predict.

Dependency Ratios

Dependency ratios assume that all members of certain age groupings are dependent. A change in retirement ages can increase or decrease dependency for the older group. If mandatory retirement age is abolished, who can say how many in the younger group will become dependent later because of lack of job opportunities? If the trend of increasing work participation for women changes, how will this affect utilization of GIS and also the growth in GNP?

Real Growth

What will be the real economic growth of Canada in the future? Will it be such that the expected dependency ratios will be easily carried, or will it be so slow that even a lesser dependency ratio will seem intolerable? This is the key question for the future. No discussion of the dependency burden is meaningful without assessment of Canada's long-range prospects for real growth.

Government Programs

Will the share of government expenditures on the aged increase as a result of political pressures, or will government programs be less important in relation to the total provided for retirement income from all sources? It is to this question the Commission believes serious consideration must be given now. Retirement income provision by nature is a long-term matter; due consideration must be given to a system that is reasonably adaptable to future developments. The Commission's approach is to provide some degree of flexibility in retirement income design.

SUMMARY

In conclusion, the Commission agrees that proper weight should be given to Canada's possible demographic future; but it finds itself in agreement with the following statement in a paper prepared for the National Symposium on Aging held in 1978:

"The policy issues related to meeting the needs of the elderly population in Canada today, and those that will arise in the future with the expected increase in both the number and the proportion of the population who are elderly, have been the cause of some considerable and increasing debate during the last couple of years. However, in terms of the economic implications of policy regarding the aged, the discussion has often been marred by confusion and unnecessary alarm.

"The primary reason for this appears to have been the tendency to compress conceptually, within short time horizons, the deep

structural changes which are taking place in the economy, as well as frequently to exaggerate the behavioural adjustments that individuals make to institutional changes. For instance, alarmist points of view have recently been expressed regarding the potential impact of demographic changes on the economy and its institutions. It is not always understood that economic processes often unfold very slowly; indeed, many of the perceived problems frequently discussed these days may not take place until two decades into the next century. Furthermore, major forces may yet be unleashed in the future to alter completely any projections which we would make today on the basis of past trends and estimated behavioural impacts. Thus, it is not easy to make a calm, rational evaluation of many of the existing or expected changes in the economy, particularly as they relate to the aged at any point in time or to the aging of society in general."(4)

The specific effects of demographic projections on the Canada Pension Plan will be dealt with in detail in the section on the CPP funding.

NOTES

- (1) This is the approach taken in a paper entitled, "Some Demographic and Economic Aspects of Canada's Aging Population," prepared by the Ministry of Treasury, Economics and Intergovernmental Affairs, Taxation and Fiscal Policy Branch, 1978. The discussion on "effective dependency" is drawn from this paper.
- (2) See Daniel Kubat, "The Demography of Older Canadians," in Volume IX.
- (3) See Appendix A-1 and A-2.
- (4) Brian J. Powell and James K. Martin, Economic Implications of an Aging Society in Canada, Ottawa, 1978.

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Chapter 5

Funding the Canada Pension Plan

WHAT IS FUNDING?

Money to pay pension promises has to come from somewhere. When it is set aside in advance of the time pension benefits are payable, that process is "funding" for benefits to be paid sometime in the future.

Pay-As-You-Go

If pension benefits are paid as they fall due without any assets being accumulated, the plan is said to be operating on a pay-as-you-go (or "pay-go") basis.

Full Funding

In a funded plan, money is set aside with a third party to provide for future benefits. If at any point in time the assets accumulated are sufficient to pay all accrued benefits as they fall due, the plan is said to be "fully funded." To the extent that not all accrued benefits can be paid at a particular point in time the plan is only "partially funded." Various patterns of "funding," or deciding how much must be put in the fund now to pay benefits later, have been developed. To the extent that a fund is built up, interest on that fund is available to pay a portion of the benefits, and so reduce the direct cost.

FUNDING AND SOCIAL SECURITY PROGRAMS

Social security programs generally are financed on a pay-as-you-go basis. The rationale is that a government-sponsored program relies ultimately on the ability of government to raise the necessary money by taxation. Old Age Security and the Guaranteed Income Supplement are

operated on this basis, as are other forms of social assistance and family benefits. Old Age Security originally was paid out of a fund provided by earmarked taxes, but this arrangement was dropped in 1975. Payroll deductions for the Canada Pension Plan are in effect a form of taxation from a specific group.

Private sector employment pension plan design, on the other hand, requires a fund for two main reasons:

- a) to ensure that assets will be available out of which to pay benefits regardless of the continuing existence or solvency of the employer;
- b) to ensure orderly financing so that costs will not become unmanageable as the plan matures or the composition of the covered group changes. This provides equity between different generations of plan members and helps an employer to price his products realistically; it facilitates recognition of the cost of plan amendments which increase benefits or liberalize the conditions for receiving them.

In a social security program it is assumed that the plan will continue in perpetuity, since the plan is backed by the taxing power of the government. The creation of a fund for the reasons in a) above is generally considered unnecessary. The argument against a fund is carried further when it is pointed out that creating a fund which is invested in government bonds affords no greater security than an unfunded plan, because the reliability of government bonds is likewise rooted in the taxing power of the government. It might be possible to externalize the liability for the assets in a fund if the assets were invested in equities or were lent abroad, but these options have other political and economic connotations which might make them unacceptable to the public.

The second reason for funding, the control and spreading of future costs, may however be justified for government programs, so that the cost burden of the plan can be levelled over the years and over different age cohorts of workers. Without some mechanism for smoothing in a completely pay-as-you-go plan, costs will continue to rise as more and more people become entitled to benefits from the plan.

It is with the pay-as-you-go approach that the structure of the population becomes particularly important. So long as there are sufficient young workers coming into the plan stream to meet the costs of the payments out to the retiring workers without undue burden, the plan can operate smoothly.

FUNDING OF THE CANADA PENSION PLAN

Unlike Old Age Security, the Canada Pension Plan is now operating on a partially funded basis. A contribution rate originally set above the pay-go rate created an excess of contributions over current benefits, resulting in the buildup of a fund which in 1978 stood at \$14.3 billion.

Funding Patterns

Under the terms of the CPP its position is analyzed in Statutory Actuarial Reports prepared by the Federal Department of Insurance. One purpose of these reports is to provide information about the funded status of the plan and the need to change contribution rates based on three different plan funding patterns, which are designated in the reports as Funds A, B, and C. These patterns may be described as follows:

Fund A

- Phase 1 The present contribution rate of 3.6 per cent of contributory earnings exceeds payment of benefits and expenses. The excess constitutes a fund which is lent to the participating provinces. The investment earnings, being interest payable by the provinces, is likewise lent to the provinces. This phase is completed when current benefits and expenses are greater than current contributions.
- Phase 2 Current benefits and expenses are paid from current contributions plus that part of the interest on the fund required to make up the difference to pay benefits. To the extent interest is not required to meet the payments, the fund will continue to grow. When the funds available to the provinces for new loans drop below the amount the provinces must pay for interest to meet current benefit costs, the cash flow to the provinces becomes negative and Phase 2 is completed.
- Phase 3 When current benefits and expenses exceed current contributions plus the current interest on the fund, the provinces must repay their loans to meet current costs. Phase 3 is completed when the fund is exhausted.

When Phase 3 is completed, either the contribution rate must rise to the pay-go cost, or other sources of funds have to be found to meet current costs.

Fund B

- Phase 1 Same as for Fund A.

Phase 2 Instead of the cash flow to the provinces becoming negative, the contribution rate rises to the then pay-go rate to pay for current benefits and expenses and continues to rise in the future as required. In the result, interest payable by the provinces continues to be loaned to them, and the fund continues to increase by the amount of these new loans. Interest is never used to pay benefits.

Fund C

Phase 1 Same as Fund A.

Phase 2 Same as Fund A.

Phase 3 The contribution rate rises to the then pay-go rate to pay for current benefits and expenses, and continues to rise in the future as required. In the result, the fund remains at the level attained at the end of Phase 2, and the loans to the provinces are never in fact repaid. Although interest is used to pay benefits and expenses, in real terms the fund and interest payments become less and less significant.(1)

With these funding patterns the question to be resolved is, "how soon and at what pace should the contribution rate begin to rise to its ultimate level?"(2) In coming to grips with this question the timing of the various phases in the development of the CPP funding pattern have become known as "critical years." These critical years coincide with the phases discussed under Fund A. From a policy point of view it is important that a decision be made on the future financing of the CPP before the end of the Phase 1 of Fund A is reached, i.e., before the first critical year. Statutory Actuarial Report No. 6 fixes this year at 1985. The earlier report dealing with this projection, Statutory Actuarial Report No. 3, fixed the first critical year at 1982, while the original projection fixed the first critical year at 1981.

Full Funding Issue

From the description of these funds we can describe the CPP at the present time as being partially funded. If any of the patterns described are adopted, the CPP will gradually move closer to a pay-go system. However whether pay-go is the correct funding method for the CPP has become the centre of keen debate. This debate intensified with the release of a working paper entitled, "Review of Issues in Financing the Canada Pension Plan" by the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs in April 1976. In challenging this paper, Geoffrey Calvert in Pensions and Survival(3) comments that decisions for financing the CPP are "one of the major decisions of the decade in Canadian finance." According to Calvert, the choice of funding method will have the most far-reaching impact on:

- Federal-provincial relations;
- Provincial spending and borrowing arrangements;
- Present and future CPP tax rates;
- Individual equity and windfalls from the CPP;
- Intergenerational subsidies between people;
- The capital markets;
- Private enterprise.

"It would therefore be a good thing if Canadians were to become somewhat familiar with the options that lie open, and to get some sense of what is quietly buried in the equally inviting looking, though statistically dry presentations of Funds A, B and C."(4)

THE COMMISSION'S PROJECTIONS FOR THE CANADA PENSION PLAN

The seriousness of the decisions to be made persuaded the Commission of the need for a complete actuarial examination of the existing plan status as well as exploratory work on a number of possible approaches.

The most current CPP statutory actuarial report at the time the Commission started its investigation was the third, as at December 31, 1973. The economic assumptions of this report for 1976 and later were as follows:

Annual increase in average earnings, 5.5 per cent;

Annual increase in the Consumer Price Index, 3.0 per cent;

Annual rate of interest on new investments, 6.5 per cent.(5)

Comparing these with more recent developments, it appeared to the Commission that it should carefully consider the assumptions on which its own work should be based, while recognizing that all assumptions take into account long-term trends rather than short-term movements. The Commission consulted a number of experts in the various fields in which assumptions were to be made, and determined a set of assumptions upon which its actuarial work for all phases of the report is based. This provides a consistency throughout the report which the Commission felt was important since it sees all phases of retirement income provision as parts of a whole. The bases for the selection of various assumptions are set out in the Methodology section of this Volume.

Three alternative sets of economic assumptions and four sets of fertility assumptions were used in many of the projections to give some idea of the sensitivity of the results to different possibilities, alone and in combination.

The Commission's Fertility Assumptions

Table 1
The Commission's Fertility Assumptions(6)

Year	Net reproduction rates			
	Low/low	Low	Most probable	High
1971-74	Actual rates from Statistics Canada.			
1975-84	Rates determined linearly by interpolation from 1974 and 1985 values.			
1985	.90	1.00	1.20	1.45
1990	.90	1.00	1.10	1.30
1995	.90	1.00	1.00	1.15
2000 and later	.90	1.00	1.00	1.00

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Resource Study, "Methodology and Assumptions."

The Commission's "most probable" assumption is less pessimistic than those adopted by many today. It reflects both a baby boom echo (births produced by the baby boom cohorts) and the perception that some of the present low fertility may arise from postponed child-bearing rather than no child-bearing. These concepts are discussed in the Resource Study, "Methodology and Assumptions," in this volume, and in greater detail in Volume IX in the papers prepared by Daniel Kubat, Sociologist to the Commission. It must be remembered that the fertility assumptions are important for forecasting the future working population. The absolute numbers in the retirement cohorts between now and 2030 have already been born.

By contrast to the Commission's most probable fertility assumption, the Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977, uses a net replacement ratio of 1 throughout for its main projections and .9 for its auxiliary projections. The latter represents the low fertility assumption used by Statistics Canada for its "Population Projections for Canada and the Provinces 1972-2001." The Commission's work in its range of assumptions therefore includes both these fertility forecasts for comparison purposes.

As we noted in the chapter on Demography, population projections take into account both fertility and net immigration. Recent changes in the Immigration Act will affect the type and age distribution of immigrants, and this in itself will have interesting effects on the number of additional workers in the work-force and on additional births.(7)

There is no indication that these changes were taken into account in the Statutory Actuarial Report 1977 assumptions.(8)

The Commission's Economic Assumptions

Key assumptions for any projections for the Canada Pension Plan are the economic assumptions. The economic assumptions used by the Commission are summarized in Table 2.(9)

Table 2

The Commission's Economic Assumptions

		<u>Wages and salaries</u>		<u>Interest rates(a)</u>	
		Real	Total	Real	Total
	Inflation	Growth	Growth	Return	Return
(Per cent)					
A. Most probable economic scenario					
1978	7.3	-.3	7.0	1.7	9.0
1979	6.0	2.0	8.0	2.3	8.3
1980-84	5.5	1.8	7.3	2.4	7.9
1985-89	5.0	2.0	7.0	2.6	7.6
1990 and later	4.0	2.1	6.1	2.4	6.4
B. High probable economic scenario					
1978	9.3	-.3	9.0	1.2	10.5
1979	8.0	2.0	10.0	1.8	9.8
1980-84	7.5	1.8	9.3	2.4	9.9
1985-89	7.0	2.0	9.0	2.6	9.6
1990 and later	6.0	2.1	8.1	2.4	8.4
C. Low probable economic scenario					
1978	6.3	-.3	6.0	1.8	8.1
1979	5.0	2.0	7.0	2.5	7.5
1980-84	4.5	1.8	6.3	2.5	7.0
1985-89	4.0	2.0	6.0	2.7	6.7
1990 and later	2.0	2.1	4.1	2.4	4.4

a Based on long-term government bond index (10 years and over) increased by .30 of 1 per cent to adjust to Government of Canada bonds with terms of 20 or more years.

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Resource Study, "Methodology and Assumptions."

If we examine some of the relationships in the Commission's most probable economic assumptions the following points are clear:

a) Inflation

The rate of 6 per cent assumed by the Commission in 1977 for 1979 has proved to be incorrect. 1978 was also higher than the predicted rate. The High probable scenario is closer to

reality. However all scenarios forecast a decline in rates to more traditional levels by 1990; this decline, barring such shocks as that engendered by the OPEC price increases, is likely to reflect reality. The Commission compared the effects of the high probable assumptions against those based on most probable assumptions and was satisfied that the differences were not significant for long-term planning. Comparisons are set out in the next chapter.

b) Real Wage and Salary Growth

1978 rates reflect the presence of the Anti-Inflation Board. 1979 returns to the expectation of the traditional growth rate of 2 per cent. The downswing in the period 1980-84 forecasts a continuing oversupply of labour while the return to 2 per cent in the next period reflects the predicted skilled labour shortage of the late 1980s. It is noted in Statutory Actuarial Report No. 6 that the annual real increase in earnings may have dropped below the traditional long-term 2 per cent to 1.5 per cent, although 2 per cent was used for the main projections. The Commission used a long-term rate of 2.1 per cent but also made projections based on .5 per cent above and below that level; we therefore have projections which can be compared with the Statutory Actuarial Report.

c) Investment Rate of Return

There is also a movement away from historical patterns in our assumption for real rate of return on investments. The Commission does not adopt the 3 per cent traditional rate but has geared the rate of return to actual experience, with projections based on long-term rates for government bonds.

Since the design of the CPP requires the interest rate on loans to the provinces to be set in relation to rates on long-term Government of Canada bonds there is justification for using these rates, normally slightly less than the rates on private issuer securities. The trend line for ten-year bonds shows a 2.25 per cent rate; by extrapolation the Commission has adopted a 2.4 per cent rate for twenty-year bonds of the provinces.

d) Work-force Participation Rates

A striking feature of recent years has been the increasing work-force participation of females. At younger ages the proportion of women in the work-force is quite high, and not much room remains for further improvement. At ages over 40, however, we may expect a yet higher proportion of women to work outside the home. This trend is correlated with changing lifestyles and to some extent with the falling birth rate, although many women resume working as soon as possible after child-bearing and rely on day care facilities and care provided by others in the home. The evidence suggests that partici-

pation rates for females will continue to grow until they are close to those of males. The Commission's assumptions show a higher participation of females in all age groups than do those used for the Statutory Actuarial Report No. 6.

Participation is also affected by unemployment and the tendency for people to spend more years at school. Retirement age policies also affect participation; the work-force is reduced by any move towards early retirement, but will be increased as mandatory retirement rules are removed. The Commission believes participation rates for both men and women in the over-60 group will increase in times of high inflation. If more flexible retirement age policies are adopted even higher participation may result, but our projections are based on present practices.

Other Assumptions

Other assumptions were required before the Commission made its projections. Where possible, the Commission adopted assumptions identical or similar to those used by the Federal Department of Insurance in its projections for Statutory Actuarial Report No. 6. It has been possible therefore to draw useful comparisons, (in Chapter 6) keeping in mind the differences in fertility and economic assumptions.

Areas for Analysis

Having determined its assumptions and made its population projections for Canada, Canada less Quebec (the population base for the CPP), and Ontario, the Commission set about making projections for the period 1978 to 2050 for the following aspects of the CPP:

1. Expenditures - a breakout of amounts paid for
 - a) retirement benefits,
 - b) welfare benefits (disability, survivor, and orphan benefits),
 - c) cost of indexing each of a) and b);
2. Expenditures - in million of dollars and as a percentage of contributory earnings;
3. Contributions on three bases - pay-go, partially funded and fully funded (entry age level cost).

The resulting projections were used for comparisons of the effects on the Statutory Report funding patterns, Funds A, B, and C, defined previously in this chapter. In addition, the Commission tested three other possible designs which it designated Funds D, E, and F. These funds reflect the use of entry age level contribution to determine contribution rates for different combinations of benefit. Entry Age

Level Cost was determined by taking an age cohort age 18 on December 31, 1977 and projecting the cost on the basis that the contribution rate would result in a nil fund for that cohort at the end of all contributions and all expenditures for that cohort.

Fund D (full funding)

All benefits and the cost of indexing for all benefits are funded on entry age level cost.

Fund E

Retirement benefits and their indexing costs are funded on entry age level cost and all welfare benefits and their indexing costs are pay-go.

Fund F

Retirement benefits (unindexed) are funded on entry age level cost, and welfare benefits and the cost of indexing for both retirement and welfare benefits are pay-go.

Also developed from the projections were figures showing the fund size as a multiple of the benefit pay-out in the year. This is useful to assess a suitable fund size. The effect of reinstating the earnings test used in the CPP until 1974 was also tested for Funds A, B, and C.

We decided that special consideration should be given to the effects of the baby boom on the plan. We therefore made further calculations to determine the "extra" births over the assumed normal total fertility rate, and projected the effects of this group on funds A, B, and C.(10)

When we examined the projection runs for Funds A,B, and C, we found that the Ontario figures did not vary significantly from the Canada less Quebec figures. Therefore we eliminated this breakdown for further runs. For those interested we have included in the Appendices several tables showing Ontario figures compared with those for Canada less Quebec. Ontario ranges very close to the 50 per cent mark for expenditures, is slightly lower in terms of unfunded actuarial liability and is slightly above the average level for pay-go contributions until after 2025. It is clear that Ontario pays and receives an appropriate share under the plan and there are no aberrations which appear likely to disturb this position for the future.(11)

We have also included a comparison of dependency ratios between Ontario and Canada less Quebec, based on our most probable fertility assumption.(12) Again, in view of the negligible differences, we did not project Ontario dependency ratios on other fertility assumptions, but proceeded on the basis of the Canada less Quebec projections.

These projections give us the information we need to sort fact from fantasy in the debate on the Canada Pension Plan. The most relevant tables are published in Appendices A to F. The complete projections can be made available to interested persons through the Ontario Archivist.

NOTES

- (1) Description of funds from Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977.
- (2) Ibid., p. 5.
- (3) G.N. Calvert, Pensions and Survival, Toronto 1977, Chapter 5.
- (4) Ibid., p. 87.
- (5) Canada Pension Plan Statutory Actuarial Report No. 3 as at December 31, 1973, p. 55.
- (6) See Volume V, Resource Study, "Methodology and Assumption."
- (7) "Methodology and Assumptions." See also: Daniel Kubat, "The Demography of Older Canadians," in Volume IX.
- (8) Canada Pension Plan Statutory Actuarial Report No. 6, 1977, pp. 40, ff.
- (9) See "Methodology and Assumptions."
- (10) Appendix D, Tables D-14, D-15 and D-16.
- (11) Appendix C, Tables C-9, C-10 and C-11.
- (12) Appendix B, Table B-2 and B-3.

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Chapter 6

Analysis of the Commission's Projections

The first step in the Commission's assessment of the Canada Pension Plan was to forecast the future of the plan on its present funding pattern, based on the Commission's projections. This meant looking at several aspects of future cost: the effect on fund patterns A, B, and C; the effect on contribution rates; the effect of reintroducing the former earnings test; and the effect of varying the assumptions. Finally, the results were compared with the latest Statutory Actuarial Report for the plan.

Future Cost of Existing CPP Benefits

Assuming that the benefit structure remains unchanged and at its present level, the costs of the CPP on a pay-go basis expressed as a percentage of contributory earnings based on the Commission's most probable assumptions are as follows:(1)

1978	2.36 per cent
1980	2.86
1990	4.61
2000	5.73
2010	6.34
2020	8.08
2030	9.28
2040	8.87
2050	9.45

Note that until after 1985, contribution income at the present rate of 3.6 per cent more than covers benefit payments.

The cost rises steadily to about 2-1/2 times the present rate, but does not reach the full funding rate of 9.66 per cent discussed

below.(2) The cost reaches a peak in 2030 and then declines, illustrating the effect of the baby boom of the 1945-1965 period.

Future Cost of Existing CPP Benefits by Category

Because the CPP provides disability pensions for disabled workers and their dependents and survivor pensions for survivors of active workers, as well as retirement pensions and retiree survivor pensions, the Commission sought information on their respective cost. Table 1 shows costs separately for non-indexed portions of retirement pensions, disability benefits (called welfare benefits elsewhere in this Volume)(3) and the costs for indexing the respective benefits,(4) as well as the total pay-go costs for these benefits. All costs are expressed as a percentage of contributory earnings to the plan for the respective years. Thus, in 1980, non-indexed retirement benefits account for 1.44 per cent of contributory earnings, and indexing of retirement benefits .28 per cent, for a total of 1.72 per cent; total cost for all benefits, indexed, plus expenses, is 2.86 per cent of contributory earnings for the year.

From Table 1 we see that "welfare" benefits account for about 40 per cent of the total cost in 1980. As the plan matures, the proportion for welfare drops to 25 per cent. These figures assume a constant proportion of disability in the work-force; an increased propensity to claim disability pensions, or lowering of retirement entitlement age, would change the balance between retirement and welfare components.

The indexing cost rises from 15 per cent of the total in 1980 to about 28 per cent after year 2000 and then to 30 per cent based on the "most probable" assumptions. The division of the cost into the indexed and non-indexed portions is sensitive to changes in assumptions for the rate of inflation. If the inflation assumptions were changed, total cost as a percentage of contributory earnings would not be greatly affected, but the allocation between indexed and non-indexed would be. It is important to realize that there is a significant cost for the full indexing under the plan, and that the cost of providing it does represent 30 per cent of the cost by 2010 - or double today's cost related to contributory earnings.

Future Cost for Ontario

The costs of CPP benefits for Ontario alone were calculated using the same fertility and economic assumptions but an Ontario population base. Costs for Ontario expressed as a percentage of contributory earnings were higher than for the overall plan until about year 2025, and then were lower. The maximum difference was about 6 per cent in the year 2000.(5) The higher cost for Ontario can be attributed to differences in the present age distribution and work-force participation in Ontario. The differences are significant, but not so large as to

Table 1
Canada Pension Plan Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors		Total	
	Non-indexed portion	Indexed portion	Non-indexed portion	Indexed portion	Non-indexed portion	Indexed portion	Non-indexed portion(a)	Indexed portion
	(Per cent)							
1978	1.21	.17	.29	.02	.52	.05	2.12	.24
1980	1.44	.28	.29	.05	.59	.11	2.42	.44
1983	1.56	.42	.29	.08	.64	.19	2.59	.69
1985	1.69	.51	.30	.09	.64	.24	2.73	.83
1987	1.92	.61	.31	.10	.66	.29	2.99	1.00
1990	2.27	.74	.32	.12	.70	.37	3.39	1.23
2000	2.85	.99	.34	.13	.80	.51	4.10	1.63
2010	3.21	1.11	.38	.15	.81	.58	4.50	1.84
2020	4.43	1.47	.39	.15	.89	.66	5.81	2.28
2030	5.16	1.89	.34	.13	.94	.72	6.54	2.75
2040	4.63	1.99	.37	.12	.92	.74	6.03	2.85
2050	5.19	2.01	.38	.12	.92	.73	6.59	2.87

a Includes expenses.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions. See Appendix C-4.

suggest that the Ontario government should on this account pursue different policies from other provinces.

Effect on Cost of Varying Assumptions

The effect on costs of varying the fertility and economic assumptions is shown in Table 2.

Fertility

The effect of varying the fertility assumptions is negligible until after the year 2000 when people born after 1978 begin to enter the work-force. Predictably, a low birth rate would require a higher contribution rate and a high birth rate would reduce it. The effect of changing the fertility rate assumption would be at its maximum in year 2030, would diminish to 2040, and would rise again by 2050.

As we have noted, fertility assumptions are subject to a large margin of error; hence, projections become progressively speculative as we look further into the future. However, projections are useful in indicating the range of effects that varying fertility could have on CPP costs. Thus, by the year 2020, assuming the Commission's most probable economic assumption, the costs compared with the Commission's most probable fertility assumption would be increased by 10 per cent if we used the very low fertility assumption, increased by 5 per cent if we used the low fertility assumption, and decreased by 7-1/2 per cent if we used the high fertility assumption.

Economic

The effect of changing the economic assumption is also shown in Table 2. Briefly, the low and high economic assumptions are that inflation will be 1 per cent lower and 2 per cent higher than the most probable inflation rate. The most probable long-term rate is assumed to be 4 per cent per annum. The growth rate of average wages and salaries is taken as 2.1 per cent above the rate of inflation in all scenarios.

It will be seen that the inflation rate has only a minor effect on total benefit payments on a pay-go basis, expressed as a percentage of contributory earnings. There is however some "inflation dividend" after 1990. Costs are lower with high inflation; but the differences are not more than 1-1/2 per cent at any time.

However, inflation has an important effect if the total cost is split between the cost of indexing and the cost of benefits before post-retirement indexing. Table 3 shows that the indexing cost after the year 2000 levels out at about 30 per cent of total costs (on the most probable economic assumptions). However, it would be 39 per cent if inflation were 2 per cent higher and about 24 per cent if inflation were 1 per cent lower.

Table 2
Canada Pension Plan Comparison of Expenditures as Percentages of Contributory Earnings for Various Economic/
Fertility Assumptions

Assumptions Economic: Fertility:	Most probable				Low		High	
	Most probable		Low/High		Most probable		Most probable	
	Low	High	Low	High	Low	High	Low	High
	(Per cent)							
1978	2.36	2.36	2.36	2.36	2.34	2.37	2.37	2.37
1980	2.86	2.86	2.86	2.86	2.85	2.89	2.89	2.89
1990	4.61	4.60	4.60	4.62	4.68	4.34	4.34	4.32
2000	5.73	5.82	5.79	5.65	5.78	5.59	5.59	5.68
2010	6.34	6.79	6.62	5.99	6.38	6.26	6.26	6.71
2020	8.08	8.87	8.45	7.48	8.11	8.02	8.02	8.81
2030	9.28	10.63	9.82	8.49	9.32	9.21	9.21	10.56
2040	8.87	10.50	9.42	8.06	8.92	8.79	8.79	10.40
2050	9.45	10.60	9.50	9.13	9.52	9.34	9.34	10.48

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario. See Appendix C-7 and Appendix G-1.

Table 3
Canada Pension Plan Expenditures as Percentages of Contributory Earnings, Canada less Quebec, 1978-2050

	Most probable			High inflation			Low inflation		
	Total Cost	Indexed Portion	Ratio	Total Cost	Indexed portion	Ratio	Total cost	Indexed portion	Ratio
	(Per cent)								
1978	2.36	.24	10	2.37	.27	11	2.34	.23	10
1980	2.86	.44	15	2.89	.52	18	2.85	.40	14
1990	4.61	1.23	27	4.34	1.45	33	4.68	1.06	23
2000	2.73	1.63	28	5.59	2.03	36	5.78	1.36	24
2010	6.34	1.84	29	6.26	2.35	38	6.38	1.51	24
2020	8.08	2.28	28	8.02	2.94	37	8.11	1.85	23
2030	9.28	2.74	30	9.21	3.56	39	9.32	2.23	24
2040	8.87	2.85	32	8.79	3.68	42	8.92	2.33	26
2050	9.45	2.86	30	9.34	3.70	40	9.52	2.33	24

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility assumptions.

The reason may be explained readily. Benefits under the Canada Pension Plan are indexed and therefore rise with inflation. Wages and salaries rise with inflation, and the limits on contributory earnings under the CPP are also indexed. Hence inflation has little effect on the ratio of benefits to contributions in a particular year. If, however, inflation increases, the original dollar amount of pension buys less, and the indexing adjustment needed to maintain the real value of the pension must be higher. Contributions increase, since the indexing adjustment to contribution income is built in. As a result, while inflation has little effect on contribution percentage rates, it causes the portion of the contribution rate for the original pension to fall and for the indexing element to rise. Appendix G-1 shows the result of what might be considered the worst scenario for the CPP for the future, within the Commission's range of assumptions, i.e., the combination of high economic assumptions (inflation rates continuing at 6 per cent) and low/low fertility rates (.9 fertility rate producing a declining population). Comparing the figures in Table 2 and Appendix G-1, we can see the "inflation dividend": from higher rates of inflation results in contribution rates after 1980 which are actually lower than for low/low fertility and most probable economic assumptions.

Effect of Funding Patterns on Cost Projections

Cost projections for the CPP will produce different results depending on the funding design selected. The foregoing discussion dealt with cost on a completely pay-go basis. Once a design of partial or full funding is selected, different cost patterns will emerge.

For fund A the contribution rate remains fixed at 3.6 per cent throughout the three phases described earlier. The ends of these phases have become known as the "critical years." The Commission's projections on its most probable assumptions show the crucial years to be the following:(6)

1. The first critical year is 1986. This is the first year the cash flow to the provinces from contributions is zero. In other words it is the first year that payments for benefits and expenses exceed the income produced by the 3.6 per cent contributions. The provinces are required to pay interest on their borrowings from the CPP fund, but this money is also available for new loans unless required for benefits. For several years after the first critical year, the fund continues to grow because interest exceeds the net outflow of benefits (payments less contributions).
2. The second critical year is 1991. This is the first year the provinces cannot borrow any part of their interest payments. In other words it is the first year that payments for benefits and expenses exceed the contribution income plus the interest on the CPP fund. The fund has reached its peak and has started

to decline. From this point on, the provinces have to make capital repayments as well as paying interest on the outstanding balances.

3. The third critical year is 2001. This is the year that the fund is exhausted. In other words, it is the first year that payments for benefits and expenses exceed the contribution income plus the interest plus the remaining balance in the fund. At this point the provinces have completely repaid their borrowings from the CPP fund. Unless contributions are increased, the plan must borrow from the federal government in order to pay the benefits and expenses.

Having established the critical dates, let us examine the costs involved in the alternative funding pattern set out in the Statutory Actuarial Reports. Fund A assumes no change in the 3.6 per cent contribution rate until the fund is exhausted in the third critical year. Fund B assumes that contributions will be raised at least to the pay-go rate in the first critical year, so that the provinces do not repay capital; interest is paid and borrowed back, and the fund continues to grow by the interest because interest is not used to pay benefits. Fund C assumes that contributions will be raised in the second critical year, so that the provinces do not have to repay capital but do make annual interest payments which are used to pay benefits. The fund is then fixed in size at the end of the second critical year.

The contributions required and the size of the fund under these three methods are shown in the following table. The funds in dollars are very large; for convenience, the funds are shown as multiples of the benefit outgo in the year. Under Fund B the fund continues to grow but not at as fast a rate as benefits. Under Fund C the fund remains constant but declines in relation to benefits.

Table 4

Comparison of Contribution Rates as a Percentage of Contributory Earnings and of the Fund Size as a Multiple of Benefits

	Contribution rates			Size of fund		
	Fund	Fund	Fund	Fund	Fund	Fund
	A	B	C	A	B	C
	(Per cent)			(Per cent)		
1980	3.6	3.6	3.6	8.5	8.5	8.5
1990	3.6	4.61	3.6	4.0	4.7	4.0
2000	3.6	5.73	5.07	.3	3.8	1.6
2010	6.34	6.34	6.05	-	3.1	.7
2020	8.08	8.08	7.92	-	2.4	.3
2030	9.28	9.28	9.19	-	2.1	.1
2040	8.87	8.87	8.83	-	2.1	.1
2050	9.45	9.45	9.43	-	2.0	-

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-1.

Full Funding Projections with Pay-go Elements

The Commission constructed its own designs for full funding projections. These designs are referred to as Funds D, E, and F. These funds are basically those required for a fully funded Canada Pension Plan. The funding methods do not depend on critical dates, but spread some or all of the cost on a level contribution basis. We have chosen 1980 as the starting year for the increased contribution rates. Costs are computed for retirement benefits, welfare benefits, and the indexing of these benefits.

Under Funds D, E, and F, the plan or part of the plan is funded on an entry age level cost actuarial funding method, the basis often chosen for employment pension plans. Fund D applies this funding method to all benefits; Fund E applies it to retirement benefits only; and Fund F applies the method only to the non-indexed part of retirement benefits. Other benefits in Fund E and Fund F are provided on a pay-as-you-go basis. In each of these funds a liability exists at the beginning because the present population is over the assumed entry age; i.e., part of the membership has been in the plan before 1980 and has not paid the level cost for the first 13 years of the plan's operation and the years before that. The level cost for these years would have been more than the 3.6 per cent actually paid. For our calculations, this liability is spread over 50 years (only 15 years would be allowed for paying off such a liability in an employment pension plan).

On the Commission's most probable assumptions the contribution rates and the fund accumulations are as follows. The fund is expressed as a multiple of the benefits paid in the year.

Table 5
Comparison of Contribution Rates as a Percentage
of Contributory Earnings

		Contribution rates		
	Pay-go	D	E	F
(Per cent)				
1980	2.86	12.53	9.48	6.98
1990	4.61	12.53	10.82	8.78
2000	5.73	12.53	11.11	9.31
2010	6.34	12.53	11.24	9.59
2020	8.08	12.53	11.40	10.08
2030	9.28	9.66	9.38	9.18
2040	8.87	9.66	9.41	9.30
2050	9.45	9.66	9.40	9.32

Source Royal Commission on the Status of Pensions
in Ontario, Volume V, Appendix D-4.

In its analysis the Commission isolated costs for welfare benefits and for indexing both retirement and welfare benefits. The object was to explore areas of possible compromise whereby retirement benefits might be fully funded and other elements would be on a pay-go basis. The pay-go arrangements for the other elements would then follow the OAS which is paid on a current basis out of government revenues. The difference would be that OAS is paid for by all taxpayers while the CPP pay-go elements would be paid for by all contributors to the CPP. It was also a question of what proportion of the CPP would be taken up by disability benefits in the future. The projections show that expenditures for welfare benefits (assuming the same degree of utilization as at present) will actually decline from their present 40 per cent to 25 per cent of retirement benefit costs. Concerns that the welfare element will outweigh the retirement aspects of the CPP appear to be unfounded. Looking at Table 5 and the contribution rates required for each of Funds D, E, and F we see that contribution rates for full funding (Fund D) are not greatly in excess of those for Funds E and F with various combinations of full and pay-go arrangements, except during the first ten or fifteen years of the fifty years during which the unfunded actuarial liability is being paid off. Once we reach 2030 and the unfunded liability is paid the rates for each of the Funds D, E, and F are very similar. They are also close to the pay-go rate. Turning to fund size, we see from Table 6 that the funds generated by patterns from Funds D, E, and F would be enormous, both in total dollars and as a multiple of current benefits.

Table 6

Comparison of Fund Size in Billions of Dollars and as a Multiple of Current Benefits

	Billions of dollars (rounded)			Multiple of benefits		
	Fund D	Fund E	Fund F	Fund D	Fund E	Fund F
1980	25	23	21	11.7	10.6	9.7
1990	219	170	124	24.6	19.1	13.9
2000	712	556	392	31.8	24.9	17.5
2010	1,854	1,455	1,010	36.6	28.7	19.9
2020	4,247	3,323	2,266	35.1	27.5	18.7
2030	8,860	6,855	4,607	33.9	26.3	17.6
2040	16,788	12,915	8,670	35.1	27.0	18.1
2050	31,828	24,379	16,370	33.7	25.8	17.3

Source Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-4.

The implications of these fund projections for both the Canada Pension Plan and the finances of the Government of Ontario are discussed in the next chapter, which deals with the funding debate.

Effect on Cost of Reintroduction of the Earnings Test

When the CPP was instituted, a person between age 65 and 70 was not entitled to receive his full retirement pension from the CPP while he had earnings from employment. The test encompassed \$1 offset in retirement benefits for each \$2 of earned income from 18 to 30 per cent of the YMPE, and \$1 for each \$1 of earned income in excess of 30 per cent of the YMPE. This followed the practice in the U.S. Social Security program, whose primary objective "was to help prevent economic insecurity due to loss of earnings in retirement by providing cash income for those who had substantially withdrawn from the labour force." (7) The U.S. system continues to impose an earnings test until age 72. In Canada, however, the earnings test was removed from the CPP in 1974 and from the Quebec Pension Plan in 1975.

The Commission decided to ascertain the cost effect of reintroducing the earnings test in its original form. The effects, based on the Commission's most probable assumptions, are shown in detail in Appendix D-9 to D-13. The following conclusions can be drawn from the projections:

- With the earnings test, pay-go contributions are reduced by approximately 4 per cent (see Appendix D-9). For example, pay-go costs in 1980 are 2.73 per cent with the earnings test and 2.86 per cent without; in 2020, 7.76 per cent as opposed to 8.08 per cent, and in 2050, 9.08 per cent as opposed to 9.45 per cent.
- The full funding contribution rate is about 2.2 per cent lower with the earnings test (9.35 per cent as opposed to 9.56 per cent) while the 50-year amortization payment of the initial entry age unfunded actuarial liability is about 6 per cent lower (2.7 per cent as opposed to 2.87 per cent). The combination of the two cost factors for full funding is .38 per cent lower (12.05 per cent as opposed to 12.43 per cent) (see Appendix D-13).
- Under Fund A the maximum fund occurs in 1993 instead of 1992, and the fund is exhausted in 2003 rather than 2001 (see Appendix D-10). (The significance of these dates will be discussed later in this chapter.)

Reintroduction of the earnings test would therefore result in possible cost savings. To make this change means moving from all absolute entitlement at age 65 to the U.S. practice of income replacement after substantial retirement from the labour force. This would require a major policy change.

Comparison of the Commission's Projections with Statutory Actuarial Report No. 6

The Commission decided to undertake its own projections of the CPP because of the criticism directed at some of the assumptions in Statutory Actuarial Report No. 3 as of December 31, 1973. However, during the course of the Commission's work, Statutory Actuarial Report No. 6 as of December 31, 1977 was released. This report updated the federal Department of Insurance projections for the CPP. A comparison of Report No. 6 and the Commission's projections is useful to assess the significance of differences in assumptions. Appendix E is a complete summary and comparison of the report and the Commission's work. The more important differences are:

1. Ultimate rates of growth in real wages (earnings less inflation) were established at 2.1 per cent by the Commission and 2 per cent by the Department of Insurance. This is a significant change for the Department, since it used a 2.5 per cent real rate in the 1973 valuation. The change resulted from leaving the assumption for average growth in earnings at 5.5 per cent and moving the inflation rate from its previous level of 3 per cent to 3.5 per cent.
2. The Department's rate of investment return was kept at its former level of 6.5 per cent. With a 3.5 per cent inflation rate this assumes a real rate of return of 3.0 per cent. This compares to the Commission's ultimate real rate of 2.4 per cent.
3. Although the ultimate fertility rates reached by both groups were virtually the same, the key difference is the Commission's use of the "baby boom echo" as recommended by Kubat for the period ending in 1995, providing a higher fertility rate to the year 2000.
4. A major area of difference occurs in the immigration assumptions. The Commission started with a net annual figure (immigrants less emigrants) of 60,000 and increased this by 1/2 of 1 per cent per year to an ultimate fixed level in the years 2000 and later. The Department of Insurance on the other hand, took net immigration at a constant .465 per cent of each year's total population. The additional population resulting from this higher net immigration assumption has a significant impact on pay-go contribution rates. For example, the 8.73 per cent pay-go rate for the year 2050 on the Department's assumptions becomes 9.45 per cent if net immigration is frozen at 100,000 per year as the Commission has done. The Commission's assumption for net immigration may be somewhat on the low side, but the divergence becomes most noticeable in the distant years of our projections.

5. The Department and the Commission used identical mortality rates. Extension of the improvement in mortality from the year 2000 to the year 2050 has resulted in an increase in pay-go contribution rates of about .5 of 1 per cent by the year 2050. If life expectancy does not improve to the extent projected, pay-go costs will be somewhat lower.

Even with these differences we find that the Department's projections and those of the Commission do not diverge greatly in any aspect.

Statutory Actuarial Report No. 3 as at December 31, 1973 estimated that with the amendments to the plan (which were subsequently adopted) the first critical date, i.e., when contributions equal payout, would be as early as 1982. Report No. 6 at December 31, 1977 has put this date back to 1985 based on the new projections. The Commission's projections set the date at 1986. The following chart compares the estimates of the critical dates:

Table 7
Canada Pension Plan - Critical Years

CPP actuarial report	1966	1969	1972 No.3	1973 No.4	1973	1977 No.6	1978 Royal Comm.
Year benefits first exceed contributions	1981	1985	1985	1985	1982	1985	1986
Year benefits first equal contributions plus interest	1986	1995	1996	1995	1988	1990	1991
Year fund is first exhausted	2001		2014	2008	1999	2003	2001

- NOTE - The CPP has been improved on several occasions.
- The "1973 proposed" plan is basically the plan now in force.
 - The above dates are estimated from the CPP Actuarial Reports, some of which give figures at five-year intervals only.
 - Where the report gives several projections, the intermediate has been used. The 1966 figures assume 4 per cent inflation. The 1969 and 1972 figures assume "reasonable stability." The 1977 figures assume a narrowing between the rate of increase in earnings and increase in prices.
 - The Royal Commission projections are based on its most probable assumptions.

Source The Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix E.

Pay-go contributions using Fund B design are very close for the two sets of projections until 2000. Thereafter they diverge significantly, so that by 2050 the Commission's rate of 9.45 per cent is nearly 8 per cent higher than the Department's 8.76 per cent.(8) Lower immigration, higher inflation, and slightly higher growth in real wages in the Commission's assumptions have led to this result.

Some further contrasts in the population and financial results of the projections are shown in Appendix E-3, including:

1. The population projected by the Commission for the year 2050 is about 87.5 per cent of the one projected by the Department of Insurance. This reflects primarily differences in immigration.
2. Absolute dollar expenditures projected by the Commission are 49 per cent higher than for the Department of Insurance projections but contributory earnings are also considerably higher for the Commission's projections due to the higher assumptions for growth in earnings and therefore higher amounts from contributions.
3. The fully funded rate for the Commission is higher than the Department's (9.56 per cent against 8.04 per cent) in part because of the lower real rate of return on investments. A change in the real rate of return by the Department of Insurance from 3.0 per cent to 2.5 per cent leads to a 9.38 per cent entry age cost which is very close to the 9.56 per cent rate developed by the Commission.
4. The initial unfunded entry age actuarial liabilities developed by the Department of Insurance are lower than for the Commission projection which is \$98.5 billion. The Department's projections are \$81.3 billion for the Department's most probable scenario which uses a 3.0 per cent real rate of return, and \$84.4 billion with a 2.5 per cent real rate of return. The unfunded liability difference also arises from the Commission's higher assumption for growth in earnings.

Comparison of results of the two sets of projections for Fund C on a number of alternative assumptions will be found in Appendix E, Tables E-4 and E-5.

Statutory actuarial reports on the CPP are designed to give policy makers ample notice of decisions to be made. The Commission's projections and those of the Statutory Actuarial Report No. 6 are so close that the Commission is satisfied that the critical dates shown by the Department of Insurance can be relied on for the purpose of making policy decisions. Postponement of the earliest time when contribution rates would have to be raised from 1982 to 1985 or 1986 gives more time for decision making; but it should not be used for procrastination. A

decision should also be made now on the ultimate disposition of the fund. If for instance, the fund is to be allowed to run out after the turn of the century, the provinces should be given notice now, since the repayment of the borrowed capital may be a particularly heavy burden on some provinces. Consideration of policy alternatives is set out in the Commission's recommendations.

NOTES

- (1) See Appendix C-4.
- (2) The fully funded contribution rate is 9.56 (expenses of .1 per cent omitted) + 2.87 to amortize the existing unfunded liability over 50 years, for a total required contribution rate now of 12.53 per cent. The pay-go contribution rate never meets the fully funded rate if the GNP in real terms (that is with inflation discounted) is rising, due to growing population or growing productivity per capita. The workers who support the pension load today, say at 10 per cent of today's GNP, will, when they retire, receive more than that, namely 10 per cent of GNP in a future year. This fact is sometimes referred to as the "social insurance paradox."
- (3) "Welfare benefits" includes disability pensions and surviving spouses' and orphans' pensions arising from the death of an active worker. Survivor pensions arising from retirement benefits have been included in retirement benefits. See Volume V, Resource Study, "Methodology and Assumptions."
- (4) Indexing cost is for post-retirement adjustment of benefits according to movements in the Consumer Price Index. Pre-retirement adjustments of contributory earnings, based on the Average Industrial Wage, are included in projections of initial retirement benefits.
- (5) See Appendix C-9.
- (6) See Appendix D-3 for detailed projections.
- (7) Wm. C. Greenough and Francis P. King, Pension Plans and Public Policy.
- (8) See Appendix E-2; and Statutory Actuarial Report No. 6, p. 7.

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Chapter 7

Problems in the Funding Design of the Canada Pension Plan

When the CPP was adopted in 1965 specific decisions were made on its funding design. These decisions produced a hybrid design which involved both pay-go elements and fund accumulation. The pay-go contribution rate required at that time was less than 1 per cent, but the decision was made to fix a 3.6 per cent contribution rate. Funds not needed for current benefit payments were then available for provincial borrowing. At the outset it was understood that major decisions would have to be made in 20 or 30 years' time about the course of CPP operations because the fund would be ultimately exhausted and contribution rates would have to rise.

Had the original decision been to finance the CPP on an entirely pay-go basis, today's concerns would be relatively simple, though perhaps controversial to the extent that pensions are viewed as an increasingly heavy burden on the active labour force. The need for higher contribution rates would be evident; but the increments would be gradual and, over a fairly long period, predictable according to the retirement rate of present contributors.

Instead, the controversy has raged around three perceived, though not necessarily real, problems:

1. The potential exhaustion of the fund has conjured up the spectre of bankruptcy, with thousands of disillusioned retirees whose CPP benefits must therefore remain unpaid. The prominence given by the press to this highly fanciful scenario seems to have created widespread cynicism about the plan. No doubt it has also created much unwarranted anxiety among the millions

of Canadians who count on CPP benefits as a large portion of their retirement income.

2. The possibility, based on low birth rates, that the number of workers available to support the retiring baby boom of the postwar era will be so small that there will be revolution rather than submission to onerous contribution rates. This problem is also stated in terms of the inequity of intergenerational subsidies.
3. The theory that a pay-go public pension results in lower personal savings - hence a loss of capital to increase productivity and national wealth. Presumably a fully funded plan would create capital and produce real growth in the economy.

The Commission has directed its attention to each of these problems and the effect on the Canada Pension Plan of several possible solutions.

PROBLEM NUMBER 1 - BANKRUPTCY OF THE CPP

The first problem arises from funding design. A fund has been created which in 1978 stood at about \$14.3 billion. Statutory Actuarial Report No. 6 has set out possible funding patterns under the designations Fund A, Fund B, and Fund C. The Commission's projections for these funds are described in the preceding chapter and compared with those in Report No. 6. Other funding options may be conceived, but the three used in the Statutory Actuarial Report illustrate possibilities for future policy decisions. In that context we find the critical years described earlier, i.e. the times forecast for the various events to take place. The Commission projections are within 2 years of the critical years set out in Report No. 6. Depending on which option - Fund A, B, or C - might be selected, the critical year indicates when some decision must be made as to changes in the funding design. Questions for CPP policy-makers include the following:

- whether to raise the contribution rate and by how much;
- whether to cut benefits and by how much;
- whether to change the contribution base to increase contributions;
- whether to change entitlement age to reduce benefits in the short run.

There are many possibilities for change. The mandate of this Commission is to consider the options and recommend a suitable course to the Province of Ontario.

The first problem involves a misunderstanding of the effect of the third critical year under Fund A, when contributions plus interest plus fund assets equal benefit payout (2001-2003). At that time the fund will indeed be exhausted. This does not mean that the CPP is thereby bankrupt. It does mean that some change in financing will have to be made before then to provide the money required to pay the benefits due in the next year.

Sometimes the unfunded actuarial liability of the CPP, calculated as it would be for a private pension plan, is pointed to as an indication of the precarious position of the CPP. The unfunded actuarial liability on an entry age level cost basis for funding as projected by the Department of Insurance at December 31, 1977 is between \$81 and \$85 billion. This liability, estimated by the Commission at \$98 billion, is the amount which would have to be paid into the CPP in 1978 which, with future contributions and interest on the fund would pay for all benefits of those now aged 18 and over. However, to relate this liability to the soundness of the Canada Pension Plan, which is premised on continuance in perpetuity, is meaningless. Like the fear of bankruptcy it indicates an imperfect understanding of the nature of a social insurance program.

A final facet of Problem No. 1 is what has been labelled "Ghost Funding"(1) in the press. Nearly all of the assets in the CPP fund are paper promises of the provinces to pay back the borrowed money with interest.(2) Borrowings are made through non-marketable provincial securities having a term of 20 years, with interest at the average market yield on 20-year Canada bonds applicable at the time of the issue. It is argued that there are no "real" assets to back up the promises of benefits under the CPP, and that by some sleight-of-hand the provinces have drained away the cash and replaced it with paper. The less-than-market rate of interest on the securities has been combined with "Ghost Funding" allegations to attack the credibility of the whole CPP fund design. Although CPP security depends ultimately on the taxing power of the provinces to repay their obligations, it is important that the public have confidence in the plan. The need for CPP funds to be invested in a different fashion is discussed in the Commission's proposals.

PROBLEM NUMBER 2 - SUBSIDIES

There are three types of subsidies in the CPP as it now stands:

1. When the plan was set up, no benefits were paid to those who had made no contributions, and only partial benefits were paid to those who had contributed for less than ten years. However, by 1976 full benefits were payable to those who had contributed for ten years. This short transition period means that those retiring and qualifying for benefits at the present time receive maximum benefits but have contributed for well under

half of their working lives. Therefore, they receive very substantial subsidies. The subsidy is greater than it is for those retired before 1976 who could not receive full benefits, and also greater than for those who will retire in future, who will have contributed longer. Moreover, contributions were established at a low rate which will have to be increased in the future. This favours those retiring in the early years and those with higher incomes. For example, someone who reached age 65 in 1976 had contributed only 1.8 per cent of contributory earnings for only ten years (matched by the employer) and received a pension for life equal to 25 per cent of his or her average pensionable earnings, adjusted for inflation.

The first subsidy can be defended as necessary to ensure that the plan came into full operation in a reasonable time. The fast maturing of the plan has obvious advantages. If benefits were strictly related to contributions paid, then since contributions start at age 18 and retirement age is 65, it would be 47 years before anyone could claim the maximum pension. The pensions produced even today would be quite inadequate.

2. Since the CPP is earnings-related and contribution rates are of equal percentage throughout the range of covered earnings, those with higher earnings benefit more proportionately. For retirements in a particular year, the subsidy is roughly proportional to earnings up to the earnings ceiling, which means that it is higher for people with higher incomes. Some who regard the contribution as a tax therefore criticize the design as "regressive."

This subsidy should not be considered in isolation, since OAS and GIS are part of the package and were reorganized about the time that the Canada Pension Plan was introduced. Subsidies to the higher paid in the Canada Pension Plan are to a large degree balanced by subsidies to the lower paid under OAS and GIS.

3. Much has been written about intergenerational subsidies in the CPP, particularly those arising from the baby boom. The argument is that on a pay-go basis contribution rates will have to rise sharply when the baby boom population reaches retirement; if the work-force has not expanded proportionately the workers will face a very heavy burden. In this way the baby boom cohorts who paid for a proportionately smaller retired group while they were active will not in fact have paid the price for their retirement during their working lives. Funding to provide cost control, as in a private plan, therefore becomes relevant for a social security plan and is the crux of problem number 3.

Intergenerational subsidies differ in important respects under full funding, partial funding and pay-go arrangements.

Full funding produces the highest contribution rates, but it virtually eliminates intergenerational subsidies. Contributions would have to be very high to remove all subsidies; to remove them for the average future entrant to the system would increase the contribution rate from 3.6 to 12.53 per cent in 1980, reducing to 9.66 per cent by 2050 by which time the unfunded liability would have been paid off.(3) An enormous fund would also be created, the use of which by government raises important policy questions.

Pay-go requires the smallest contributions in the early years, but because of our population structure will require sharply increased contributions about 2020, rising to 9.28 per cent by 2030. This in turn means large intergenerational subsidies. No fund is developed, since by definition revenue from contributions is equal to benefit payments.(4)

Partial funding steers a middle course between full funding and pay-go. A fund is created during the time contribution levels exceed those required for benefit payments; after that, they rise more or less in concert with benefit payments if the population distribution remains stable. Intergenerational subsidies will be reduced during the time the fund continues to be built up. The operation of the present CPP design results in partial funding.

The effectiveness of using a fund for cost control depends on interest accruing to the fund. Under existing provisions, CPP fund assets have been loaned to the provinces at interest rates below market rates. The rate is determined by the rates on long-term Government of Canada bonds, which after 1965 were low by current standards since there were few new issues. Because of this criticism or for financial reasons, the Government of Canada has recently issued new long-term bonds with current market rates. This has had the effect of increasing the rate on CPP monies lent to the provinces. However, the rate on Government of Canada bonds is traditionally below that paid on provincial bonds; therefore the CPP fund will continue to represent an attractive money source for the provinces. The existing investment arrangement falls somewhat short of the best position for maximizing interest return, and so adversely affects the cost control aspect of funding.

The question of the size of the fund created if full or even partial funding were adopted to minimize intergenerational subsidies is discussed with the economic effects of full funding below.

It is also necessary to consider how acceptable the intergenerational subsidy may be to society. From the first, the subsidy was recognized and accepted on the basis of a social contract:

"In return for making a contribution toward the cost of pensions to the current generation of retired wage earners every participant acquires a right to a certain position within the income structure of the society when he eventually retires. That acquired right implies an obligation on the following generation to meet the cost of his benefits."(5)

In order to assess this problem, especially with regard to the baby boom population born between 1945 and 1965 over which there has been so much concern, the Commission undertook a series of projections to develop the financial effects of the extra population arising from the baby boom on the Canada Pension Plan. Full details of these projections appear in Appendix D-14 to D-16.

The technique used was to isolate the "extra population" by assuming a "normal" fertility rate for the period 1945-1965 in line with historical fertility rates for the period 1926-1975 and by deducting the "normal" population projected on this "normal" fertility rate from the actual population. The difference between the two represents the "excess" population of the baby boom. The methodology used is described in detail in Section 6 of the Resource Study: "Methodology and Assumptions." Pay-go rates for the Canada Pension Plan for the "normal" and the "excess" population were then projected. The following table for Fund C, based on the Commission's most probable assumptions, shows some interesting results:

Table 1
Fund C, Canada Pension Plan - Comparison of Critical Years and Pay-go Rates for "Normal Population"(a) and Total Population including Baby Boom Excess

	Canada less Quebec	
	Total population	Excluding baby boom
1. Year cash flow first negative	1986	1984
2. Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1989
3. Pay-go contributions in subsequent years	(Per cent)	
2000	5.07	6.21
2010	6.05	6.94
2020	7.92	8.26
2030	9.19	8.90
2040	8.83	8.91
2050	9.43	9.34

a Projection using historical trend fertility rates for the period 1945 to 1965.

Source Royal Commission on the Status of Pensions in Ontario, Volume V, Appendix D-16.

From the table it is clear that until 2030 the presence of the baby boom population results in a lowering of pay-go costs for the CPP, and also an extension of time for the events of the critical years. Only in 2030 do we find the baby boom causing increased cost to the plan, and then only by .29 per cent of contributory earnings. By 2040 the extra population is having less effect on the rates required and by 2050 the effect of the baby boom positively or negatively has virtually disappeared.

The explanation is that the extra population cannot be considered as an isolated group that contributes, draws benefits, and when the last person dies, leaves the plan as it was before. The extra people will have children and grandchildren, so that the contribution income never reverts to what it would have been without the baby boom. To a large extent the extra pensions that will be paid to those born when the birth rate was high will be provided by the contributions of their descendants. While it is true that these projections are based on the Commission's most probable fertility assumption, which is somewhat more optimistic than that of Statistics Canada, the spread within the Commission's low/low fertility assumption and its most probable fertility assumption is not so great that we could expect wide divergences in the pay-go figures. Any large difference is offset by the Commission's use of a more conservative immigration assumption. See also Appendix G-7 which shows virtually the same cost pattern for Fund C using the Commission's low/low fertility and high economic assumptions.

The Commission therefore concludes that the intergenerational transfer in 2030 is neither as large nor as abrupt as some commentators would have had us believe, even if no steps are taken now to smooth out the inevitable increase in contribution rates.

In assessing the possibility of workers refusing to pay for retirees in the future, it is important to realize that the process of increased contributions is likely to be gradual and therefore accepted by each cohort of workers as one of the conditions applying to the work-force at that particular time. Had the present rates of income tax in Canada been projected in 1917 when the Income War Tax Act was passed it is entirely possible that similar predictions would have been made about the future of income taxes and any government which sought to impose them.

Nor must it be forgotten that any increase in the real growth in the economy beyond that projected between now and 2030 will ease the burden for the active workers. To test the validity of this proposition, the Commission made projections for an increase of .5 per cent in the growth of real earnings above the most probable economic assumption, and for a decrease of .5 per cent. For Fund C the effects on the critical dates and required contribution rates were as follows:

Table 2
Effect on Fund C of Variations in Real Growth in Earnings

Real growth in earnings	Most probable	Most probable -.5%	Most probable +.5%
1. Year cash flow first negative	1986	1985	1986
2. Year cash flow negative, equals fund interest, (fund remains stable)	1991	1990	1992
3. Year fund first becomes negative	2001	2000	2002
4. Pay-go contributions in subsequent years (Fund C)		(Per cent)	
2000	5.07	5.32	4.84
2010	6.05	6.35	5.77
2020	7.92	8.31	7.56
2030	9.19	9.68	8.75
2040	8.83	9.36	8.35
2050	9.43	9.98	8.94

Source Royal Commission on the Status of Pensions in Ontario.

Real growth above that projected on the Commission's most probable assumption therefore reduces the cost to the active workers. Real growth below that projected will increase the cost and therefore the burden. Because the economic future is difficult to forecast accurately except as to long-term trends and relationships, we can only assess the effects of a range of possibilities. In the Commission's opinion, the burden for the active work-force in the future is not undue even with the lower real growth in earnings (assuming no increase in benefits as a percentage of earnings).

Finally, the adoption of full funding is only one way in which to exercise cost control in the CPP. In the Commission's opinion the problem of the intergenerational subsidy is not so great as to warrant a change to full funding.

PROBLEM NUMBER 3 - DOES PAY-GO SOCIAL SECURITY DEPRESS SAVINGS?

Those recommending full funding of the Canada Pension Plan stress the possible effects of pay-go financing on the economic health of a country. One theory is that such financing for retirement programs has the undesirable effect of lowering personal savings rates. Chief among the proponents of this theory are Martin Feldstein and Alicia Munnell of

the United States. If savings rates, the argument goes, are lower, new capital for production of wealth (goods and services) is less available and therefore the country is less well off. The argument relies on the hypothesis that with the introduction of socialized protection the individual will save less for his or her own security and instead will increase current consumption. Feldstein estimates that social security wealth reduced the level of personal saving in the United States in 1971 by about 50 per cent, and that this reduction in turn reduced U.S. capital stocks with a resulting reduction in annual GNP.

This argument was adopted by the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA) in a paper presented to the Commission. The paper advanced the position that the public retirement programs in Canada (OAS, GIS, and CPP) between 1952 and 1975 lowered the rate of personal savings by 3.1 per cent, resulting in a 22 per cent reduction in personal savings from disposable income. The result for 1975 was to reduce the level of savings by \$3.5 billion and to create a cumulative decline in savings of about \$18.9 billion.(6)

It was argued that if the Canada Pension Plan were fully funded instead of on its present basis, pension fund assets would be much higher, with the result that:

"Translated into economic terms, the extra growth that would result in the Canadian economy had these funds been created and invested in the private sector eventually would finance completely the benefits paid under the Old Age Security, Guaranteed Income Supplement and Canada and Quebec Pension Plans. Thus, instead of supporting the elderly by redistributing income from the work force to the retired, they could be supported from the dividend of real economic growth."(7)

To assess the validity of the theory that public retirement programs depress rates of personal savings is therefore of importance before embarking on a course of full funding. A resource study to this volume is a review of the economic literature on social security funding prepared for the Commission by Arthur Donner and Fred Lazar.(8) Commenting on the theory advanced in the TEIGA paper the authors conclude as follows:

"From our survey of the empirical and theoretical issues surrounding the appropriate means for financing a public pension system, we conclude that the assertion that the modified pay-as-you-go financing technique is inappropriate does not hold up under close analysis. The evidence on the impact of pay-as-you-go public pension financing on personal saving is so ambiguous that it should be ignored. In any event, personal savings account for a fairly small proportion of national savings in Canada even though the personal savings rate is presently at an all-time high, and thus the pension versus savings question is far from crucial. The

related concern that the presently underfunded CPP/QPP has caused below optimum levels of capital formation in Canada should also be ignored as a real issue. The evidence supporting this proposition begins with the unfounded assertion that national savings are suboptimal and requires the acceptance of a variety of completely unrealistic assumptions about the Canadian economy. Indeed, we commented at some length on the lack of reliability and applicability of the assumptions linking theoretical long-term growth models to the Canadian economy.

"As to the point that a fully funded CPP would generate a higher real rate of return to pension contributors, we note that this depends upon what, in our view, is an inappropriate series of rate-of-return comparisons. Critics of pay-as-you-go funding point out that the correct rate of return to be used in comparison between pay-as-you-go and funded systems is not the real rate of interest that has been earned in the past, but the social rate of return on capital. We argue that there is no reason to make such a sharp distinction between the social rate and the private real rate of return to capital measures in this context, since there is a supposition here that corporations, and not the individuals in the economic system, bear the burden of corporate taxes.

"Further, in order to earn a return approximating the 10 per cent estimated real social rate estimated by Jenkins for Canada, the amount accumulated in a fully funded system would have to be invested solely in equities. As the data in Table 5 indicate, the real rate of return on equity investment has been rather dismal during the past five years, but on a fifty-year basis has been in the 5 to 6 per cent range, a level slightly in excess of the natural growth rate of the economy. If the fifty-year rate of return to equities were earned in the future, then investment of funds in equities under a fully funded system would be preferable to a pay-as-you-go system yielding a rate of return somewhere in the 3 to 4 per cent range; and, if that were the case, then the implicit real rate of return to a pay-as-you-go scheme appears about as attractive as substantial long-term public investment in equities. Under pay-as-you-go, there would not be the additional concern that a large public pension fund would swallow up most of the stock of equity capital in Canada.

"Finally, there remains the problem of the extra large dose of economic deflation Canada would experience if full-investment funding were adopted when the economy already has a high volume of underutilized labour and capital. Indeed, though the plan might increase the volume of national savings by building up a large investment pool of funds, the effect could be quite the reverse, as the paradox of thrift would likely come into play."

In addition to these difficulties with the economic arguments for full funding, the Commission has some other concerns about espousing full funding for the CPP.

Use of a Social Security Fund as an Economic Tool for Raising and Lowering the Acceptable Rate of Personal Saving in the Economy

The CPP is designed to provide a source of income in retirement. Its goals should be to provide this income in the cheapest, most efficient, reliable manner possible. If a new goal is added - i.e., the manipulation of the economy through the fund on the basis that more wealth can be created - we encounter a conflict of objectives. If full funding were adopted before the first critical date of 1985 or 1986, contribution rates would have to be increased almost immediately from 3.6 per cent to somewhere between 8.78 per cent to 12.53 per cent depending on the method chosen for funding welfare benefits and indexing.(9) A sudden increase of this magnitude, or even a gradual increase to this level over a number of years, could create dislocations through increased employer costs and a disincentive for individuals to save in other ways. Even if the fund were used to increase the real growth in GNP in time, the short-run dislocation cannot be ignored. If contribution rates were increased only over a long period, the time lag would probably offset much of the benefit from the lessening of intergenerational subsidies.

How Large a Fund Would be Created by Full Funding?

The CPP fund in 1978 stood at about \$14.3 billion. The Commission's projections for Fund C show that in the year 1991 the fund would have peaked and would remain constant at \$36.1 billion, at a level four times the total benefit payout for that year.(10) For the same year with full funding (Fund D) the Commission projects the fund to be \$251.2 billion with a multiple of 24.6 times the then current payout.(11) By 2030 with full funding, the fund would be just under \$9 trillion(12) with a multiple of 33.9 times the then current payout of \$261 billion.

Can Such a Large Fund be Utilized in the Canadian Capital Market?

Donner and Lazar point out that to maximize the return required for the economic benefits of full funding it would be necessary to invest in equities. At the present time, available investment opportunities in equities in Canada are shrinking. Total financial assets in Canada at the end of 1977 were about \$899 billion. Total financial assets of financial intermediaries in Canada at the end of 1977 were an estimated \$450 billion.(13) Already the \$40 billion representing funds invested through private pension plans and RRSPs exceeds the market value of the outstanding publicly traded portion of the 300 stocks of the composite index of Toronto Stock Exchange, and is more than half the assets of the top fifty industrial corporations in Canada, excluding the oil companies.

Even the fondest hopes for an economic boom in Canada in the last quarter of this century cannot envisage capital requirements in equity and debt securities together which could accommodate growth in capital in the CPP fund from \$14.3 billion to \$700 billion by the year 2000 and still allow for any private investors in Canada.

In the Donner-Lazar paper, the highest forecast in growth of assets of financial intermediaries is only \$1,858.5 billion(14) by 1990; on a Fund C basis the CPP Fund would account for only 2.6 per cent of the total. If full funding were adopted, it is difficult to see what type of changes would allow utilization of such huge amounts of capital, with the fund growing by \$10 billion a year in 1980 and 1981, \$62 billion a year in 1990 and 1991, and \$147 billion a year in 2000 and 2001.(15)

How Can Effective Control be Exercised over the Fund Which Full Funding Would Create?

From the time the CPP was instituted to the end of 1978, the provinces (other than Quebec) have had available to them for investment total assets of \$14.3 billion representing total contributions made to the fund, less payouts, plus interest earned on the assets in the fund. Each year the provinces may draw monies not needed for benefits and each year the provinces have availed themselves of the right. Each year the interest is utilized in similar fashion, as each province simply borrows the interest it is liable to pay; and so avoids any cash payment. As has been noted, interest rates set under the plan are lower than the market rate for provincial bonds; a provincial treasurer could be criticized if he borrowed in the market when cheaper money was available. Ontario had borrowed about 50 per cent of the total fund or \$8.4 billion by September, 1979. Coupled with the availability of money has been the great growth in government spending since 1965. In 1976, Darcy McKeough, then Treasurer of Ontario, addressing his fellow finance ministers on financing options for the Canada Pension Plan,(16) spoke of the first critical date for the CPP as the date when "under the existing financial structure of the CPP net provincial cash flow will turn around." He saw the date as the time when contributions would have to be increased, and considered the effects on net provincial borrowing:

"The question of provincial borrowing has two integral facets. First, the extent to which the restructured CPP continues to be a source of funds for provincial treasuries must be decided. Second, how provincial cash flow should relate to the financing options must also be decided. With regards for the future role of provincial borrowing, my own feeling, for reasons that are explained below, is that the CPP fund should no longer continue as an exclusive source of provincial funding. The economic legitimacy of continuing this role is certainly open to question."

and later,

"Only one fact remains immutable: net provincial borrowing runs out eventually. It is coming to grips with this fact that will finally determine the financial structure of the Canada Pension Plan."(17)

Although there is no conclusive evidence before the Commission that increased provincial government spending and the availability of funds from the CPP are linked, the fact remains that the provinces will be affected by what happens to the CPP in the next 5 or 6 years. If the structure of the CPP is changed to a full funding basis with no change in investment policy, large amounts will become available to provincial governments. Those who attack full funding declare that this temptation is more than the politician faced with short-run demands can resist. Ability to expand government programs without recourse to the tax base is a politician's dream. Can the politician be expected to exercise current restraint for long-run goals?

Assessing the future on the basis of the past, the Commission considers that continuation of the present borrowing structure with the monies in a fully funded CPP would not be in the best interests of the people of Ontario. It considers that only when monies are borrowed in the money market, at market rates, with payment guaranteed by the tax base and with scheduled repayments, can there be any meaningful restraint on government borrowing. It is significant that no one suggested to the Commission that the provinces be obliged to pay back the capital sums already borrowed from the CPP fund. In fact it may be that some provinces would be hard pressed to do so. Borrowing without concern for repayment is not conducive to wise financial management.

Proponents of full funding who admit this difficulty advocate the investment of the CPP fund in the private sector. Three existing arrangements are pointed to as successful applications of the principle. The Caisse de dépôt et placement du Québec is a Crown corporation set up in 1965 mainly for the purpose of investing the contributions received from the Quebec Pension Plan. The Caisse has achieved a reputation for independence from government control in its operations. Two features distinguish the management of the QPP funds from that of the CPP funds:

"First, the investment group in the Caisse actively and aggressively manages the funds deposited with it, while the CPP funds are channelled by a formula to the provinces. Second, the majority of the securities acquired by the Caisse are publicly offered and have market-determined yields, while the yields on CPP securities are only indirectly linked to the market. The difference between investing in securities whose prices are market-determined as opposed to private placements at arbitrarily determined prices, is significant..."(18)

Critics of the Quebec arrangement have pointed to the opportunity for the government to advance its economic policies through control of the policy of the Caisse. The priorities of the Caisse management are stated to be: first the protection of the depositors; second, preference for investments of greater potential benefit for the Province of Quebec when the expected return and potential risk between two investments are equal; and third, the creation of a market in Quebec for debt issues at fair market prices.(19)

Private placements by the Caisse have afforded long-term capital to Quebec companies and have had a positive effect on the provincial economy, in the opinion of Quebec actuary, Yves Guérard. Caisse operations have resulted in higher yields to the QPP than the CPP has obtained, although the spread has narrowed with the recent increase in rates on Canada long-term bonds. In 1976 the average yield to the QPP was 8.62 per cent; for the CPP in 1975-76 the yield was 7.54 per cent. Guérard also observes that: "a channelling of additional funds in the private sector and the preservation of market discipline on government borrowing concur in making sure the reserves are used for capital purposes."(20)

Still to be considered, however, is whether the separation between the Caisse and the Quebec government will continue. Independence can only be maintained by the forbearance of the government itself.

A second experiment in investment in the capital market rather than in government bonds is that of Ontario Municipal Employees Retirement System (OMERS). A report on OMERS investment policy in 1973 posed the following as the dominant question to be answered:

"Should the investment of the funds of OMERS be influenced, to a significant degree, by the borrowing needs of the Province of Ontario or of its local governments; or should the funds of OMERS be invested in the best interests of the employers and the members of OMERS?"(21)

Before 1975, OMERS funds were invested in special non-marketable Ontario government debentures. At that time the investment structure was amended so that a portion of all new money would be invested in the public markets under the normal rules for employment pension plan investments. Now investments are handled by the OMERS staff with an advisory board drawn from the financial community. A satisfactory rate of return is being earned on assets invested in this manner.

The change in OMERS investment policy came as a response to criticism of the government. However, the government remains free to make further amendments placing limitations on market investment in order to satisfy its own borrowing needs.

A third instance in which public pension funds are invested through the private capital market is in Sweden, where the National Pension

Insurance Fund (AP) is invested through four sub-funds to avoid possible government misuse of investment funds. A TEIGA paper, "Financing the Swedish National Pension Plans"(22) provides interesting information about the operating experience of a fully funded segment of a national pension plan. It should be noted, however, that the total amount in the fund of this segment as of April 30, 1977 was only \$25 billion, a small amount compared to the projected amounts for a fully funded CPP in 2000. The investment policy is summarized in the paper:

"The moneys are invested under the auspices of an independent agency. As of April 30th, 1977, the fund had 42 per cent of its assets in housing, 34 per cent in private sector bonds and promissory notes, 16 per cent in central government bonds and 8 per cent in local government bonds. The investment philosophy of the AP is to 'invest in good and valid security, at good interest and readily accessible for redemption.'

"These directives consequently place equity investment at a disadvantage with the result that only 0.6 per cent of the funds assets are invested in shares. Another reason for the Swedes' aversion to equity investment is the strong feeling against the government controlling the economy through its control of the fund. The administrative set up of the AP consists of representatives from the government, local authorities, employer and employee groups, consumers' groups and individual contributors groups."

Briefs to the Commission from various members of the financial community rejected the Caisse, OMERS, and Swedish approaches because of the possible exercise of government control. Instead, they advocate allocation through the regular capital markets. Canavest House notes:

"Public sector retirement savings should be allocated to investment uses through Canada's capital markets. They have a proven record as an efficient allocation mechanism.

"In the same way governments buy professional services from the private sector supplies in the accounting, legal computer systems, advertising etc. areas, investment management services could be bought in a similar fashion. Investment objectives could be pre-defined. Fees could be established through a competitive bidding system."(Brief 180)

The Toronto Stock Exchange (Brief 219) supported this position:

"Ideally, the Canada Pension Plan Investment Fund, to the extent it exists, should be managed on a competitive basis under contracts with investment managers in the private sector. Even if the government wishes to continue to purchase its own securities or those of another government, the Exchange recommends that those transactions be completed through the market process. The concept

of fair market value and an economic return which underlies private investment, whether done by private placement or public issues, should govern the investment of the enforced savings of Canada's labour force."

And in a similar vein, the Trust Companies Association of Canada states:

"The capital market in Canada is controlled by institutions in the private sector although strictly regulated by the public sector. The disciplines of the market, domestic and international, provide an important control on private and public sector spending, which the formula allocation of the CPP overrides. Participation by many private sector decision-makers in the allocation of pension savings by means of objective capital market prices is a more efficient resource allocation process, than a master allocation scheme of a board or a committee from the public sector operating outside of the discipline of the market."(Brief 361)

The Toronto Stock Exchange raises another important point for full funding of the CPP:

"Even if invested through the private capital markets, which the Exchange clearly supports should this route be taken, the plan would own significant proportions of corporate shares and other outstanding financial obligations. This raises serious questions as to how the CPP would appoint directors to corporate boards to represent the fund. What duties would such directors owe to the beneficiaries? Whose interests would they ostensibly represent? How would their duties differ from those of elected politicians when CPP beneficiaries and the electorate are virtually the same group? The lines of demarcation between private enterprise and parliamentary powers would be swept away."(Brief 219)

Answers to these serious questions were put forward by the Ontario Division, Canadian Union of Public Employees. It objected to the funnelling of CPP funds into the private corporate sector. Instead the brief made the following proposals:

"The public money accumulated through the fully funded Canada Pension Plan and public employee pension funds, instead of being used to finance the investment requirements of the private corporate sector, should instead be used in the public interest to:

- "1. Repatriate the Canadian economy by using the Canada Pension Plan and public employee pension funds as an active investment vehicle to co-ordinate and direct an industrial strategy by directly buying the outstanding equity interest of foreign owned or controlled corporations in Canada.

- "2. Pursue an industrial strategy at both the Federal and Provincial levels by using the fully funded CPP and public employee pension fund assets to invest directly in new physical plant and equipment in the manufacturing sector and the petroleum and natural gas sector through Federal and Provincial Crown Corporations.
- "3. In this latter case, a competitive market rate of return should be guaranteed to the CPP and public employee pension plans to preserve the integrity of the fund for member beneficiaries and in order to meet the outstanding fiduciary responsibility.
- "4. Establish a Heritage Fund whereby 10% of the assets of a trustee pension plan of a foreign owned or controlled corporation would be placed with the CPP fund for investment in equities of foreign owned or controlled corporations or direct investment through a Crown Corporation."(Brief 101)

Conclusions on Full Funding

Having considered all the arguments, the Commission is not convinced that a case has been established for moving to the full funding of the Canada Pension Plan. There are a number of difficulties with the theory that pay-as-you-go social retirement income plans depress savings; but even accepting the validity of the theory the practical difficulties of full funding are extremely serious.

First, full funding would require such a large and almost immediate increase in the contribution rate that the existing relationship between government and private provision of retirement income would be badly dislocated. The equilibrium following the dislocation would leave the cost for the government-sponsored part much larger than the cost for the employer-sponsored part and the result, in terms of benefits, would be the same. The political difficulty of selling such an increase without an improvement in benefits is obvious. But to increase benefits would be to compound the problem.

Second, full funding would create such a large pool of assets, even in the next twenty years, that it is impossible to forecast what effect the investment of these funds would have on capital markets. Capital requirements for energy projects will be vast, but the speculative nature of many such investments precludes any generalized commitment of CPP funds to this aspect of economic development.

Third, control of the funds created by full funding through quasi-independent government agencies is no guarantee against future government intervention. However, to invest the funds either through government or private financial intermediaries still creates the problem of the exercise of the power which goes with ownership of assets on such

a vast scale. Concentration of control in this fashion could bring us to the pension fund socialism seen by Peter Drucker in The Unseen Revolution.

In the Commission's opinion, the Canada Pension Plan's prime role is not that of an economic tool to be used to control the Canadian economy. However, care must be taken in designing future funding methods for the CPP to recognize their possible impact on the economy, and to avoid major dislocations of capital markets.

THE COMMISSION'S ALTERNATIVE TO FULL FUNDING

1986 is the first year when some change in the CPP funding pattern is likely. Contributions will approximately equal benefit payout. Some decision has to be made about the future operation of the CPP. That decision will affect all future contributors to the plan and the financing of all participating provinces. The Commission is of the opinion that the Province of Ontario should initiate, as soon as possible, the following three major changes:

1. Adopt one fund basis for the CPP to continue into the future, and discard the other alternatives;
2. Make changes in the investment structure of the CPP fund;
3. Set future contribution rates.

The Commission appreciates that these measures require the concurrence of the other participating provinces and the federal government, and that negotiations will reflect the needs of other provincial treasuries as well as Ontario's. However, the Commission recommends the following course of action for Ontario:

1. Adopt as the CPP funding pattern the present Fund C

The Commission accepts the position that it is appropriate for a contributory social security retirement income plan to be on a pay-as-you-go basis. It rejects for the reasons stated above any thought of converting the CPP to a funded plan beyond the partial funding now in place and reflected in Funds A, B, and C. It doubts the wisdom of having created a partially funded plan in the first place, other than to provide contingency monies equivalent to one or two years' benefit payout. However, the capital accumulated has been lent to the provinces and the Commission believes it impractical to recommend that the provinces be required to repay the borrowed capital as they would have to (starting in 1991) under the Fund A design. On the other hand, to virtually release the provinces from interest repayment as is implicit in the design of Fund B seems to the Commission an unwise course if the provinces are to be accountable for their borrowing. Fund C's design

resolves these problems. It calls for continuation of the build-up in the fund from its present \$14.8 billion to \$36.1 billion in 1991,(23) assuming that contributions rise to pay-go rates starting in 1986. After 1991 the fund will continue at \$36.1 billion in perpetuity, subject to some increase if its purpose is seen as a contingency fund for one or two years' benefit payout. By the year 2000, \$36.1 billion will represent 1.6 times the annual benefit payout. In 1978, the fund of \$14.3 billion is 10.5 times the benefit payout. However, the size of the stable fund continues to decline in proportion to the size of the benefits to be paid, so that by 2010 the fund represents only .7 of benefits and by 2030 only .1 of benefits.(24)

2. Make changes to the investment structure of the CPP fund

During the period between now and 1986, additional monies flowing into the fund under existing arrangements will be available for provincial financing. Between 1986 and 1991 the provinces will have a moratorium on part of the interest payments on monies borrowed. If contribution rates are increased above the pay-go rates, more capital from contributions will also be available for borrowing.

The Commission is of the opinion that the criticism of the existing investment structure is valid. It results in lower-than-market return to the fund. As a consequence, the best possible return is not available to benefit contributors; and the provinces are free to borrow monies without either the strictures of the regular capital markets or the constraint of a schedule for repayment of capital and payment of interest. Ontario taxpayers may have to pay more for capital borrowed by the province in the regular capital markets, but the benefits derived from the visibility of the cost of such borrowing and its traditional restraining effect should more than offset the increased cost in the future.

For these reasons the Commission recommends the adoption of the following changes in the investment structure:

As provincial obligations to the CPP fall due, borrowings by the provinces and interest payable on such borrowings would no longer be secured by the type of provincial undertaking now given. Starting in 1986 the first provincial "bonds" mature. As these mature they should be replaced by a new type of security: 20-year negotiable bonds issued by provincial Crown corporations, accompanied by a guarantee by the province and by a certificate of the provincial treasurer that the proceeds of the bonds are being used to invest in fixed assets, or to refinance outstanding debt used to finance acquisition of fixed assets of that Crown corporation. Whether such bonds are issued on a sinking fund basis or with a replacement schedule would depend on the nature of the issuing provincial Crown corporation, but there would be a fixed maturity date. From and after 1986, borrowings from the CPP of the

interest on the fund would similarly be secured by this type of negotiable security.

Interest on these bonds would be at market rates, set at the average rate in the twenty preceding trading days on outstanding long-term debt issued by or guaranteed by the province, denominated in Canadian dollars.

If it were thought undesirable for political reasons to set different interest rates for different provinces, then a monthly rate might be established, based on

- a) the average of interest rates on all outstanding debt issued or guaranteed by all the provinces, other than Quebec, weighted according to their CPP contributions in the year of calculation; or
- b) the actual interest rate on outstanding debt issued or guaranteed by the province involved;

with the provincial treasurer of the issuing province having the election between a) and b).

If in any month a provincial treasurer declines the funds available to the province, such funds would be invested in 90-day treasury bills until the province takes up the funds by issuing Crown corporation bonds. The treasury bills would be provincial where these are issued by the province and federal in all other cases.(25)

Several desirable effects would arise from this restructuring:

- (i) By about the year 2000 all CPP funds would be invested in negotiable debt securities issued at market interest rates, on the security of real financial assets of Crown corporations.
- (ii) A province would be forced to borrow money for its own requirements directly through the capital markets, with the constraints of market interest and the effect of borrowing on its own credit rating.
- (iii) The CPP fund would be invested in securities which are negotiable and with a regular repayment schedule so that the capital and the interest on the fund may be utilized for payment of benefits under the CPP and will facilitate the transition to a Fund C pattern without a sudden demand on the provinces for interest and capital. The present opportunity for rolling over the obligations will not be available to the provinces. They will be obliged to come to

grips with the outstanding debt within the next twenty years, rather than postpone settlement indefinitely.

- (iv) Criticisms of below-market interest rates and easy access to funds for provincial spending will be met and the whole structure will be subject to market conditions.

There will doubtless be adverse effects in terms of increased borrowing costs; but if the provinces accept the need for controlled spending, there should be little difficulty in persuading them that a Canada Pension Plan perceived by the public to be sound and well invested is worth the short-run difficulties.

Unless the CPP is changed to utilize full funding, the amounts available to the provinces will run out sooner or later, depending on the fund basis chosen. If the Fund C pattern proposed by the Commission is adopted, a fund should ultimately be maintained only for the purpose of securing benefits say, two years in advance, and will not be a source of funds for the provinces. With the CPP fund assigned this limited role, its size will diminish in relation to the expanding wealth of the country. In the long run the CPP will become essentially a pay-go program.

3. Set future contribution rates

The argument is frequently advanced that it is impossible to increase CPP contribution rates without at the same time increasing benefits. Such increases in contributions emphasize the subsidy from the present workers to those already drawing pensions who contributed less for those pensions. However, the Commission is not convinced there is an inevitable link between contribution rates and benefits, and therefore recommends there be no increase of benefits to go with the increased contribution rates.

The current 3.6 per cent contribution rate results in an increasing fund on a Fund C pattern until 1992. In order to accommodate improvements in retirement arrangements in the private sector and to avoid a faster build-up of the fund, the Commission recommends no change in the contribution rate until 1992, or more precisely, until contributions plus interest on the fund equal benefit payout.

When an increase in contribution rates is necessary, the Commission recommends a gradual phasing-in of increases to approximate the pay-go rates, with sufficient amounts accumulated above the benefit payout to maintain a fund equal to twice the year's benefits and administrative cost payments, three years in advance. Thus the contribution rates should be such that the fund on hand at January 1, 1991 will equal twice the amount required to be paid out for benefits and administrative costs in 1993.

The Commission experimented with various possible gradual increases in rates. Table D-17 in Appendix D shows the result of increasing the contribution rate to 4 per cent in 1985 and by .2 per cent every year thereafter, reaching an 8 per cent rate by the year 2000 and remaining constant thereafter. The result would be to continue the cash flow to the provinces until 2019 when contributions would again equal benefit payout; and a fund which would stabilize at \$891 billion with a multiple of 7.27 times benefits. This projection confirms the Commission's reluctance to have the contribution rates increase before 1992 or to increase much above the Fund C rate because of the enormous fund build-up and its consequent problems. The Commission therefore recommends that instead of a gradual increase by a constant percentage, the contribution rate be set at predetermined intervals, say 6 years in advance, (to accommodate the CPP amendment machinery) by determining the pay-go contribution rate required to cover benefit payout with interest from the fund, at a point two years in advance of the year in which such payout is to be made. In this way, increases in the contribution rate are gradual, are fixed well in advance, and create a contingency fund sufficiently large to smooth any unexpected decreases in total contributions without providing any long-term capital which the provinces would be anxious to borrow. Actuarial evaluations should be done frequently enough to allow for changes in the contribution rates should it appear that the rates determined at 6-year intervals are insufficient to maintain the plan with the benefits covered three years in advance.

The Commission realizes that to maintain a 3.6 per cent contribution rate until 1991 when many people are expecting an increase early in the 1980s will open the way for strong pressures to increase benefits with a small increase in contribution rates. Such a course would undermine the long-term planning for the CPP. Any increase in benefits should be costed out to the ultimate payment time, as we have done for current benefits. Until the CPP matures, part of today's work-force can expect to receive more than it actually pays for (in addition to the benefit from real growth in the economy mentioned earlier) and it is easy to understand the demand for more of a good thing. But it must not be forgotten that if CPP benefits are to double, then the cost must also double; in that event a pay-go rate of 9.45 per cent in 2050 must double to 18.9 per cent.

NOTES

- (1) Richard Osler in The Financial Post, September 10, 1977.
- (2) Any monies not taken by the provinces, and contributions received from the Yukon Territory, the Northwest Territories, and for certain employees outside Canada, are invested in Government of Canada bonds.
- (3) See Appendix D-5. Rate includes amortization of accrued liabilities over fifty years.
- (4) Appendix D-5 shows the pay-go rates 1978 to 2050.
- (5) A Report of the Canada Pension Plan Advisory Committee on the Funding Principles of the Canada Pension Plan, May 1976, p. 6.
- (6) Ontario Ministry of Treasury, Economics and Intergovernmental Affairs, "The Economics of Financing National Pension Plans" (Toronto, 1977). See also "Saving or Consumption? The Role of the Public Pension Plan in the National Economy"; remarks to the Association of Canadian Pension Management: Mandate/78, by Tristram S. Lett, Senior Budget Advisor for Pension Policy, TEIGA (September 1977).
- (7) Lett, *ibid.*, p. 5.
- (8) Arthur Donner and Fred Lazar, "A Review and Critical Analysis of the Economic Literature on Social Security," Volume V, Resource Study.
- (9) See Appendix D, Table D-2 for contribution rates for proposed Funds D, E, and F, Royal Commission's projections with unfunded liabilities amortized over 50 years.
- (10) See Appendix D-1 and D-3.
- (11) See Appendix D-2 and D-4.
- (12) 1,000 billion equals one trillion.
- (13) Arthur W. Donner and Fred Lazar, "The Impact of Social Security Financing on the Capital Markets in the 1980s," Table 42; in Volume IX.
- (14) *Ibid.*
- (15) See Appendix D-4.
- (16) Hon. Darcy McKeough, Speech to the Federal-Provincial Meeting of the Ministers of Finance, December 6 and 7, 1976.
- (17) *Ibid.*, p. 5.
- (18) "The Management of Change in the Canadian Securities Industry," David C. Shaw and T. Ross Archibald, quoted in a speech by Yves Guérard of Pouliot, Guérard and Associates, Inc., "Pension Funds and Their Impact on the Direction of the Economy," 29 September 1978.

- (19) Ibid.
- (20) Yves Guérard, "Pension Funds and Their Impact on the Direction of the Economy."
- (21) Paul Hickey, report on Ontario Municipal Employees Retirement System's Investments, August 9, 1973.
- (22) Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, Government of Ontario, "Financing the Swedish National Pension Plans," August 1977.
- (23) See Appendix D-3.
- (24) See Appendix D-1.
- (25) Only Alberta, Ontario, and Quebec now issue provincial Treasury Bills.

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Chapter 8

Issues Relating to Benefit Features

COVERAGE

One obvious reason for establishing the Canada Pension Plan was the lack of work-related pension coverage for more than half the labour force. In addition, there was the knowledge that employment pension plans provided much less than full portability, so that many of those "covered" would not in fact receive retirement benefits commensurate with service and earnings in all jobs held during their working lives. By virtue of its universality and complete portability, the CPP was the vehicle of choice to ensure a degree of earnings-related pension income for all paid workers regardless of the nature or duration of employment with any one employer. Beyond that, the CPP provided coverage for the self-employed who, by definition, had little or no access to employers' pension plans.

It is not surprising therefore that the statistics show virtually complete CPP coverage of the Ontario work-force. A comparison of coverage by the CPP and private pension plans appears in Table 1.(1)

Table 1
Estimated Coverage in Ontario Under CPP and Private Pension Plans for Selected Years 1969-76

	Labour force annual averages				Covered by CPP		Covered by private pension plans	
	Total labour force(a)	Employed labour force		Paid workers and self-employed(b) (Numbers in thousands)	Estimated number(c)	Percentage of paid employment	Plan members	Percentage of employed paid workers
		Paid workers	Self-employed					
1969	-	2,610	261	2,871	2,839	99	1,222	46.8
1973	3,509	3,015	267	3,282	3,273	99	1,446	47.9
1975	3,810	3,312	267	3,579	3,453	97	1,571	47.4
1976	3,931	3,384	271	3,655	3,504	96	1,608	47.5

a Includes employed and unemployed.

b Includes agricultural paid workers and paid workers, all ages.

c Estimates based on data in "Canada Pension Plan Contributors" various selected years, Health and Welfare Canada.

Source The Royal Commission on the Status of Pensions in Ontario, Harry Weitz, "Pension Coverage and its Potential in Ontario," Volume VIII, Table 1.

At the end of 1976, the latest year for which complete data were available, well over one and a half million workers (1,608,000) representing 47.5 per cent of the total paid workers in Ontario were covered by a private pension plan. Nearly all of these were also participants in the CPP. In that year, it is estimated that 96 per cent of the 3,655,000 employed paid workers plus the self-employed workers in Ontario were active members of the CPP. It is clear that the CPP is fulfilling its role of universality for nearly all paid workers. Those not covered fall into three categories:

- the unemployed;
- those whose annual earnings are no more than the Year's Basic Exemption (\$1,100 in 1979);
- certain classes of workers excluded from coverage such as some agricultural workers, some casual workers, and some self-employed members of religious orders.(2)

The unemployed group is a fluctuating group with coverage resuming with employment. For the other two categories extension of coverage is difficult. The Ontario Federation of Agriculture pointed out that, although basically covered by the plan design, many farmers are unable to take full advantage of the benefits provided by the CPP because they have low cash incomes. If these fluctuate or are consistently below the YMPE, the farmers lose potential credits because the greater part of the value of their work is not measured in cash terms.(3) Their problem is similar to that of unpaid home-makers whose position is much more prominent in current criticisms of the CPP.

The Unpaid Worker

Since the Canada Pension Plan benefit is earnings-related and provides for both employees and the self-employed, it does not extend to those without earned income, in particular, housewives. There is a spouse's benefit on death of the contributor either before or after retirement, but no provision for voluntary contributions by housewives or other non-earners which would enable them to obtain pension credits. Social insurance principles, on which the CPP is largely based, traditionally limit protection to earnings. The risk shared by covered workers is the loss of employment income in retirement. Unpaid work is assumed to be inferior, or not work at all, or impossible to value. By far the largest group excluded by the application of these principles is the unpaid worker in the home.

The three major Canadian political parties have espoused as an election promise the extension of the CPP to those working in the home. At first blush the proposal is attractive and apparently forward-looking; but if one examines the ramifications of such a move, there are some

aspects which could actually undermine the present effectiveness of the CPP.

The Commission is cognizant of the undesirable position of many women who are now over 65 or approaching that age(4). However, it must not be forgotten that the position of these women has been determined by a far different social and labour scene than that in which any changes in the future to the CPP will take effect.

Our examination indicates that female labour force participation rates have grown to such a degree over the past two decades that few women in the future remain at home without children, or after children are in school. For most people, economic necessity or preference has required that both husband and wife be in the work-force. Those who will stay home permanently to raise children and never enter or re-enter the work-force are those whose economic position permits. They can expect to be provided for in old age by the additional savings and private arrangements of the marriage partner. If the marriage breaks down, the CPP now provides for a division of pension credits, and the non-working partner will probably enter or re-enter the labour force. If these assumptions are correct, then to extend the CPP on a voluntary basis on some notional value of work in the home will serve only to assist those who are unlikely to require economic assistance in retirement. In this sense, such a move can be said to be regressive in nature and therefore undesirable in the context of a social insurance scheme.

It will be useful to review some of the difficulties that would be created by a general extension of the CPP to non-workers.

Any arrangement which by design would protect pension rights only for those who could afford the contributions would distort the original social insurance concept of the plan, and would not serve the needs of many who may require pension coverage. If the measure is aimed at providing pension coverage to persons with disposable income, a vehicle other than CPP is already available: the spousal RRSP which permits tax deductible contributions of up to \$3,500 a year, or as much as \$5,500 in some cases.

To introduce the concept of voluntarism to a plan that is compulsory for persons in the work-force immediately creates two sets of plan members: those who must contribute, and those who may contribute if they wish. Such a situation might be considered undesirable on human rights principles. If the plan were to be compulsory for all, it would have to be altered radically to provide for collection of contributions, record-keeping, and work valuation. We would have a new universal scheme based on notional earnings. On the other hand, if the plan were voluntary for all, there would be no guarantee that those in or out of the work-force would continue to pay and maintain coverage. The scheme of shared contributions between employers and employees would be disrupted. If contribution levels were also voluntary, the problem

would be further compounded. Apart from the reduction in eventual pension due to periods of no contributions, there would be the risk of losing eligibility for disability and survivor benefits.

Accordingly, it is questionable whether it would be regarded as an improvement to change from universal coverage in the paid work-force to optional non-coverage, or coverage for those with greater financial resources who are not in the work-force.

Other implications would have to be questioned in any scheme which, though not wholly voluntary, included voluntary contributions:

- a) If the home-maker is to contribute on the basis of imputed earnings, the level chosen would have to be minimal in order not to penalize the low-income person who is also carrying on family responsibilities; in other words, could we justify attributing higher earnings to the person doing his or her own housework and child care than are actually received by someone working as a cleaner or baby sitter for someone else?
- b) If we assume the home-maker is self-employed, the contributions will be double those paid by the spouse; as a consequence, contributions may be harder to justify if the household budget is determined by only one salary;
- c) If we assume the home-maker is an employee, then we must ask who will be required to pay the employer portion. To have the spouse do so is to re-emphasize for woman her traditional dependent role which is so strenuously being challenged today, and to create a tax on marriage. Conversely, should the double tax deduction be available to the spouse paying the employer portion? If we assume that the state will pay the "employer" portion, the inequity is compounded since all taxpayers, with or without CPP coverage for themselves, will be forced to support those with the financial means to avail themselves of this measure.

It is not perhaps beyond the ability of pension designers to come up with an arrangement which would answer these problems; but any proposals to include CPP coverage for home-makers who are not in the work-force should be assessed carefully on the basis of the real need of the persons to be covered. The Commission is concerned that the proposal attempts to meet a problem which is no longer of pressing concern. The Commission therefore is of the opinion that the Government of Ontario should resist any move to extend Canada Pension Plan coverage to unpaid workers, and should support continuation of the plan on its present compulsory and earnings-related basis.

THE CHILD-REARING DROPOUT PROVISION

While CPP coverage for homemakers as such may be impracticable, the Commission does see the need for a provision that recognizes the effect child-bearing and rearing has on the retirement income of the person who is forced to withdraw from the work-force on that account. The formula for crediting retirement benefits allows for some discontinuity of employment, but the working women whose career is interrupted by a period of raising young children will have a significant reduction in average earnings and a correspondingly lower retirement pension. Even if she is able to carry some part-time or temporary employment along with her family responsibilities, her contributory earnings record will almost inevitably suffer - not only for retirement purposes but also for eligibility for and amount of disability and survivor benefits. (This discussion applies equally to men, to the extent they assume child-rearing duties).

CPP benefits are calculated over a maximum 47 years, with a provision for "dropping out" or not counting in the calculation 15 per cent of the work history to a maximum of 7 years. This means that some allowance is made for unemployment, sickness, education or other dislocations in the worklife.

In this way, CPP pensions are designed to reflect a person's usual or "normal" earnings rather than a narrowly-defined average over the entire period during which contributions could have been made.

Child-rearing is one of a number of possible career dislocations for which the 15 per cent dropout was originally designed. However, women (and men with child-raising responsibilities) are left at a considerable disadvantage compared with other CPP contributors. Periods of child-rearing are likely to use up a large share of the 15 per cent allowance, often much more. Meanwhile, the risk of other career dislocations - sickness and unemployment, for example - remains. Accordingly, it is reasonable to consider a special dropout provision applicable to those whose child-rearing duties take them out of the regular labour force during part of the CPP contributory period.

A dropout provision for child-rearing was accepted in 1977-78 by all participating provinces except Ontario and British Columbia. As a result, the amendment - passed by Parliament and therefore reflected in the act (section 48, etc.) - has not been proclaimed. A parallel amendment was made to the Quebec Pension Plan with effect from January 1, 1977. The import of the child-rearing dropout proposal and especially Ontario's role in its rejection has led the Commission to examine this subject in some detail.

The child-rearing dropout would be applied before the standard dropout of 15 per cent. Application of this provision may best be explained by the following illustration:

At present: A person enters the work-force at age 20, makes CPP contributions for 7 years, then leaves to have children. Two are born, three years apart. The same person returns to the work-force at age 40 and makes CPP contributions for a further 20 years, leaving permanently at age 60. Earnings are recorded for pension purposes for 27 of a possible 47 years (age 18 to 65). After applying the general dropout allowance of 15 per cent, the net contributory period becomes 40 years rather than 47; the resulting pension, reflecting the person's 27 years of contributions, is 27/40 rather than 27/47 of the potential amount. Since the average Canadian woman in the labour force has a work history of about 25 years, this example is not untypical of CPP calculations for many who will divide their careers between paid work and child-raising.

As proposed: Potential contributory years would be reduced from 47 to 37; the 10-year dropout in the example is the period from the birth of the first child until the second child reached age 7. The 15 per cent general dropout then would be applied to the remaining 37 contributory years, leaving a net contributory period of 31.4 years. The person's 27 years of contributions therefore would produce 27/31.4 of the potential benefit instead of 27/40 as produced by the present formula. Restated as a percentage of the potential benefit (and substituting months as the act provides) the entitlement becomes 85.9 per cent, compared with 67.6 per cent without the child-rearing dropout.(5)

In principle, a dropout provision for general dislocations of work patterns does not differ from one applicable to a special type of dislocation such as child-rearing. With increasing participation by women in the labour force, it is valid to regard women first as workers and second as child-rearers rather than the other way around. Child-rearing then is seen as an interruption in the career, to be compensated for in the same way as sickness and unemployment.

The Business and Professional Women's Clubs of Ontario in their brief recommended the extension of a special dropout of up to 7 years in addition to the standard 15 per cent for any person obliged to be absent from the work-force for any reason, to cover patterns of work which the plan should recognize. They envisioned special circumstances involving:

- "a) Necessary care of children beyond the age of seven years, e.g., because of disability or health problems, or lack of child care facilities for school-age children.
- b) Care of dependents other than children (as defined by the Federal Income Tax Act).

- c) Extended periods of vocational education or training.
- d) Extended periods of illness or disability."(6)

The Consumer Survey carried out for the Commission indicates that about 70 per cent of the respondents favoured the child-rearing dropout provision, with women respondents (72.9 per cent) significantly more in favour than men (66.4 per cent) and younger people aged 18 to 34 (78.7 per cent) more in favour than those 35 and over (65.3 per cent). The dropout provision was advocated in every brief submitted to the Commission which dealt with the matter, and there were no dissenting voices at the Commission hearings.

When the dropout provision was considered by the provinces it was vetoed by Ontario(7) for the following reasons:

1. It requires a redistribution of benefits in the aggregate from single persons, childless couples and those who would not utilize the provision, to those who would use it. The CPP is based on the insurance principle and should not be used for redistribution of income.
2. It would create inequities because the provision would not be equally accessible to all mothers, some of whom would have to return to work because of economic necessity. A higher subsidy would result to a high earner than to a lower earner. Those not in the labour force for other reasons, such as caring for an elderly dependent, would not benefit.(8)

One answer to these objections lies in the difference between "insurance" and "social insurance" principles. That is, under regular insurance principles no subsidy or redistribution of income is envisaged, while under "social insurance" subsidies are entirely appropriate. It does not appear to the Commission that the CPP was designed on strict "insurance" principles at the outset. Three major subsidies now subsisting in the CPP design are discussed in Chapter 7. Social considerations were clearly present in the decision to provide partial pensions in the second year and full pensions after 10 years, although the recipients would have paid only a fraction of the cost. The arrangements for survivor benefits also provide for a redistribution of income in favour of married persons. In these and other structural features, the CPP reflects a clear intention to depart from conventional insurance principles in order to achieve specific social objectives.

Consequently, the crux of the argument is not whether the CPP should adhere to insurance principles, but whether there is justification for the subsidies and apparent inequities which would arise from the child-rearing dropout. On the question of subsidies, it is clear to us that the value to society of child-bearing and rearing is overriding

from any point of view, including that of single persons and childless couples. The emergence of woman as worker, entitled to recognition of her occupational skills, is of far greater significance to society than any loss to the single person and the childless couple by a redistribution in her favour. The inequities mentioned are in the Commission's opinion of less significance than the benefits to be gained for society as a whole. We doubt very much that there are many women who can now afford to stay home to raise their children. Finally, the regressive nature of the subsidy as between higher and lower earners is a problem common to every earnings-related feature of the plan, and cannot be an objection to the child-rearing dropout provision as such.

The provision has been estimated to increase the CPP costs by less than 1/3 of 1 per cent of contributory earnings by 2025. The Commission did not project the cost of this provision, but is of the opinion that its probable cost is far outweighed by the benefits to be gained. It should be noted however, that the cost is not easily ascertainable since the proposed provision is retroactive; that is, it will apply to all those who have left the plan for child-rearing since its inception, except for those already receiving a retirement pension.

Uniformity with the Quebec Pension Plan is highly desirable and should be maintained wherever possible. The QPP was amended to include the dropout provision when the CPP amendment was in process. An additional benefit in terms of uniformity would therefore accrue if the proposed dropout provision were now accepted for the CPP.

The Commission is persuaded that the child-rearing dropout is an important step toward the recognition of women as a vital part of the work-force. Their particular work patterns, reflecting the role of child-rearing in society, should be accommodated in the Canada Pension Plan so that women are not unduly penalized by their necessary and socially productive absence from the work-force. The Commission, therefore, recommends that the Government of Ontario approve the amendment to allow the child-rearing dropout provision to be put into effect without delay.

SURVIVOR BENEFITS

We have commented on the poor economic position of women just approaching 65, or over 65 at the present time. These are the people who are caught in a period of inflation and changing structures in society. The original CPP design reflected the traditional roles of the husband as breadwinner and the wife as a non-working dependent. At first therefore, the plan provided a survivor benefit for the widow of a deceased contributor in the form of a pension based on roughly 60 per cent of the contributor's entitlement. The same benefit was provided for a widower, but only if he was dependent. In other words, a widow was assumed to be dependent; in the case of a widower, dependency had to

be proved. That element of discrimination was subsequently removed, leaving in question the adequacy of surviving spouse pensions for both widows and widowers.(9)

The 60 per cent level of survivor pensions reflects the judgment that a single or widowed person living alone needs more than half the amount required for a married couple living together. This view is adopted by the Commission in its assessment of adequacy levels.(10) Many labour groups advocated in briefs to the Commission that the percentage be increased to 75 per cent, but in support of that percentage offered only the general argument that since more than 50 per cent of women over 65 were below a poverty line, CPP survivor pensions were inadequate.

In the Commission's view it is necessary to look at the composition of the group over 65 to determine the validity of that argument. An analysis of sources of income for persons aged 65 and over in Canada for the year 1976, taken from income tax returns, shows that men relied on Canada Pension benefits for only 6.8 per cent of their income for tax purposes and women for only 4.5 per cent.(11) To give some idea of the magnitude of these incomes, the statistics show that nearly 28 per cent of women's incomes was derived from the basic Old Age Security Pension. For men, the basic OAS pension represented about 18 per cent of income for tax purposes. These percentages, which are relevant to a discussion of income adequacy (and poverty lines) in 1976, could hardly have been affected significantly if CPP survivor pensions had been based on a 75 per cent rather than a 60 per cent formula. It must be remembered that all poverty-line analyses that have been used to support proposals for higher CPP survivor pensions relate to an over-65 population in which CPP pensioners accounted for only a small, though increasing minority. By 1976 only a very few were in receipt of retirement pensions at the full rate. If we were to look at the position of those few individuals and how their survivors might fare, it would be difficult enough to argue that poverty would be overcome by providing an extra 15 per cent of their very modest pensions. However, the plight of the elderly population as a whole - especially women - could have had very little to do with the CPP survivor pension formula.

Furthermore, the CPP should not be treated in isolation as a source of income. It is important to see Canada's retirement income sources working together to provide income for survivors. Old Age Security with the GIS and GAINS, as well as the CPP, combine to provide a standard of adequacy which in the Commission's opinion requires only a slight upward adjustment.(12) This adjustment can best be made through a program based on actual need. The Commission also favours the retention of the 60 per cent ratio for the survivor benefit to fit in with its assessment of the correct relationship between the amount required for a single person and that for a married couple. (Note that a slightly higher ratio [two-thirds] is required in government programs for adequacy at minimum income levels. See Volume I, Chapter 6).

For the future, it is perhaps significant that projected expenditures on the unindexed portion of survivor benefits rise very slowly between 1982 and 1990, with the percentage actually falling for the year 1984 and then resuming a slow increase.(13) Survivor benefits include those payable both to survivors of retired contributors and of those dying before retirement. Some of the increase in the benefits will result from higher benefits paid to retired contributors as the plan matures and full benefits become payable. It is therefore arguable that survivor benefits will actually become less significant as more women join the work-force and accumulate retirement benefits in their own right.

The Commission therefore recommends that the survivor benefit payable to the survivor of a deceased retired contributor continue to be approximately 60 per cent of the pension benefit of the retired contributor, and that the Government of Ontario resist any extension of the existing survivor benefits relating to deceased contributors.

DIVISION OF PENSION CREDITS DURING MARRIAGE

As we have seen, the design of survivor benefits in the Canada Pension Plan implies dependency in the marriage relationship. As more women enter the work-force and earn pension entitlements in their own right, the overall importance of survivor entitlements will be reduced. An amendment to the plan, effective in 1978, provided for the splitting of CPP pension credits on termination of marriage. The more radical proposal of a division of credits during marriage was discarded. If we examine the two proposals we can see how the differences in underlying philosophy affect the result.

With credit splitting on dissolution of marriage, the basis is the same as for other types of support. On divorce, the spouse (usually the wife) is losing a source of retirement income. Therefore it is reasonable to treat the potential entitlement as a present asset to be taken into account in settling future support arrangements. The mechanism is available upon application within three years of dissolution. It may be expected that the exercising of this right to apply will increasingly be the subject of negotiation between the parties at dissolution.

Credit splitting during marriage however would not be based on a support obligation, but rather on the concept of marriage as an economic partnership in which both spouses work - in the work-force or at home - to create a joint asset. In general the terms the proposal would work as follows: where only one spouse works in paid employment the CPP credit would automatically be split, with half transferred to the credit record of the home-maker spouse. Where both spouses work, one-half of their respective credits would be transferred to the credit record of the other. At age 65, each would receive a retirement pension based on half the combined pension credits. Unless both spouses contributed on

the maximum YMPE continuously, the higher-paid and more regularly employed of the two would be relinquishing a benefit to the other spouse. This appears to have an element of fairness between the spouses, in that joint sacrifice is made for the creation of each of the two pensions. By comparison to the present situation, however, it means that since women are generally employed at lower salaries, there would be a redistribution of pension entitlement away from the male spouse toward the female. Taken together, it may also mean that the family unit will be worse off than if the couple had accrued separate pensions. Where one spouse is 65 and the other under 65, a CPP pension based on one-half the joint credits may be too small to allow retirement of the first spouse until the second also reaches 65.

These problems of equity and feasibility, together with questions about the nature of changes in attitudes and practice that are likely to flow from Ontario's Family Law Reform Act, suggest to this Commission that no immediate steps should be taken to extend the splitting of CPP credits to apply to all married contributors. At the same time we reiterate our approval of a less traditional attitude toward dependency in the married relationship. In the continuing studies of the CPP and its effectiveness in achieving social objectives, we trust it will be possible to give more tangible expression to the principle of economic equality for individuals within the family unit.

The Cofirentes report(14) made recommendations for QPP survivors' benefits which embrace this principle more whole-heartedly than perhaps is warranted at this time. The recommendations(15) contemplate a survivor's benefit of an increased amount but of limited duration, and payable only between the survivor's age 35 and 65.(16) The duration of payments would depend on the presence of dependent children.(17) Where there are no dependent children the survivor's pension would cease after one year. Otherwise, payments would continue during the dependency of the children or, where the children are very young, for three years after the youngest child is seven.

The reasoning seems to be that the survivor's benefit is to assist during a period of adjustment rather than to provide permanent income replacement. Similarly, the recommended increase of the death benefit from the present 10 per cent to 15 per cent of the YMPE would fit in with that concept.

Particularly important is the Cofirentes recommendation that no survivor's annuity be paid after age 65. At that time presumably the survivor is expected to rely on OAS, GIS, and any QPP pension earned as a contributor. This Commission cannot support these recommendations in light of present-day realities, particularly the position of the unpaid home-maker or the low-paid worker with broken service patterns under the CPP/QPP. Rather than reducing utilization of GIS for this group, adoption of these proposals would increase it. Benefits limited to a period of adaptation to a new lifestyle might be sufficient for the

younger survivor, but not for someone age 70, for example, who can hardly be expected to adapt readily to the loss of both spouse and spouse's retirement income. Such changes as those recommended for those 65 and over would require phasing-in over a number of years. In any event, it is clear to us that the benefit structure of a social insurance program must recognize the realities of today's individual and family relationships. While it is desirable to anticipate and accommodate significant long-run developments such as those that are now changing the economic position of women in the family and the work-force, it is not the proper function of the Canada Pension Plan to force the pace of this evolutionary process and to create hardship for those who do not fit the emerging pattern.

LEVEL OF BENEFITS

At present the Canada Pension Plan provides a retirement benefit of 25 per cent of average adjusted pensionable earnings. Pensionable earnings relate to the Year's Maximum Pensionable Earnings (YMPE) - currently rising at 12-1/2 per cent each year until it reaches the same level as the Average Industrial Wage (AIW) after which the two will rise in tandem. Thus the goal of the CPP is often expressed as a pension equal to 25 per cent of earnings for a person at the Average Industrial Wage level. Together with OAS equivalent to about 15 per cent of the AIW, government program benefits are designed to provide about 40 per cent of the AIW in gross terms.

The Commission's net replacement ratio analysis(18) shows that for a person retiring at the Average Industrial Wage level at the end of 1978, the combination of all government benefits for a person in Ontario including CPP and income tax effects resulted in "available income" having a net replacement ratio for a single person of 50 per cent and for a married couple, both over age 65, 75 per cent. For those earning less than the AIW the net replacement ratios were much higher, and in fact exceeded 100 per cent for both single and married couples both over 65 earning the minimum wage. Any private pension benefits would be in addition to these benefits except to the extent that they were integrated with the CPP or served to reduce GIS and GAINS benefits.

There have, however, been proposals in recent years for increasing the benefit structure under the CPP/QPP. Two such proposals are representative of different approaches.

1. The Canadian Labour Congress, in its 1978 policy statement,(19) made the following recommendation:

"...that the Old Age Security and Guaranteed Income Supplement should combine to provide all Canadians over 65 with an income which is above the poverty line. In addition, the basic benefit under the Canada Pension Plan should be increased to 50 per cent of

earnings up to the average industrial wage. The Canada Pension Plan and Old Age Security should combine to provide workers with 75 per cent of their pre-retirement earnings if they earned the average industrial wage. The percentage should be higher if their pre-retirement earnings were below the average industrial wage, and the percentage should be lower if pre-retirement earnings were above the average industrial wage. We also recommend that the CPP be amended so that actuarially reduced benefits would become available at age 60 and so that surviving spouses over 65 could claim 75 per cent of the retirement benefit to which a deceased contributor was entitled rather than 60 per cent as is now the case. Finally, new benefits under these programs should grow with the average industrial wage, and once benefits have begun to be paid to a retiree, they should be indexed to the Consumer Price Index.

"The benefits we are proposing are a substantial improvement over the current situation in Canada and they will guarantee all Canadians an adequate retirement income. But, they are not excessive in relation to the objective to be achieved, or by comparison with the standards already established in Europe. Furthermore, while these proposals may eliminate the future need for some employer based plans, they in no way undermine benefit credits already earned and they still leave room for employer based plans to take care of early retirement and the supplementary income needs of workers whose pre-retirement earnings are above the average industrial wage."

The CLC bases its argument on the shortcomings of private pensions in providing "adequate retirement incomes to all Canadians" and cites as specific shortcomings the lack of universal coverage, less-than-immediate vesting, inadequate benefit levels, and lack of indexing. All of these shortcomings are eliminated in the design of the Canada Pension Plan.

The CLC cites three objectives it feels should be adopted by "public retirement income schemes":

- no retiree will have to live in poverty;
- 75 per cent of pre-retirement earnings should be paid to a retiree from public sources of retirement income;
- the real value of public retirement income must be guaranteed by automatic indexing to the Consumer Price Index.

The CLC acknowledges that there is real value to retirees from Ontario's tax credits and GAINS benefits, but prefers a national system to a provincial one to allow for the high mobility of the labour force.

It also views programs such as Ontario's as a reflection of the general inadequacy of retirement income.

Emphasis is also placed on the need to consider OAS, GIS, and CPP as a system of public retirement income. It sees reliance on the GIS for non-workers, but prefers the use of the OAS and CPP to meet the goals for retired workers, since these provide income "as of right."

The CLC proposal was supported by a number of union groups in their submissions to the Commission. The original CLC proposal called for an increase in CPP benefits to 75 per cent of average adjusted pensionable earnings. This has since been reduced to 50 per cent, which coincides with a proposal made in a study conducted by Martin O'Connell M.P. in 1975.

2. The Cofirentes Report (1978) recommended changes to the Quebec Pension Plan which are of importance to the structure of the CPP in light of the need for parallelism between the plans. The report recommended:

- that retirement benefits be increased to 50 per cent on pensionable earnings based on the lower half of the YMPE and remain at 25 per cent on the upper half of the YMPE, resulting in a rate of 37-1/2 per cent for persons earning at the level of the YMPE;
- that the increase recommended take effect without a transition period and apply to all retirement benefits now in payment as well as in the future.

The Quebec committee, like the CLC, recognized the interplay of the QPP with the GIS and the OAS. The objectives to be met by the Cofirentes proposals were:

- to eliminate from the GIS all but non-workers and workers with inadequate work histories;
- to eliminate the need for workers earning below the average industrial wage to belong to private pension plans;
- to ensure that the worker at the minimum wage level would receive 90 per cent of pre-retirement after-tax income from the combined OAS and QPP.

Cofirentes also recommended that the OAS continue unchanged; that the indexing of QPP benefits to the Consumer Price Index continue; and that the YMPE ceiling for employers' contributions be removed so that employers would contribute on the total earnings of the employee.

Should the Level of Benefits be Increased?

Part of the answer to this question depends on one's view of the role of government in retirement income provision. We have noted elsewhere two general objectives:

1. to ensure that no one lives below a minimum standard acceptable in our society;
2. to replace a measure of pre-retirement earnings, and thereby assist individuals to maintain their living standards.

At present the obligation of fulfilling the first principle rests directly with the government and is dealt with in Ontario by the OAS with the GIS and Spouse's Allowance, income tax exemptions, Ontario Tax Credits, GAINS, and free prescription drugs, as well as other types of subsidy. The Commission has found some inadequacy in the combined provisions and has recommended improvement. For a full discussion see Volume I of the report, Chapter 6.

Analysis shows that "available income" from government programs including the CPP, for the retired person age 65 in Ontario who has worked at the minimum wage throughout his working career, will provide net replacement ratios as follows:(20)

Single person	87.9 per cent
Married with spouse under 60	102.7 per cent
Married, spouse 60-64	137.9 per cent
Married, spouse 65 and over	145.3 per cent

The Commission is satisfied that net replacement figures are much more meaningful than gross replacement ratios. We therefore question the usefulness of the analysis in the brief of the CLC based on gross figures. The brief acknowledges that aiming for replacement ratios defined on a pre-tax basis will raise the replacement ratios defined on an after-tax basis, but makes no attempt to assess the difference or to take into account other income items.

The CLC proposal also advocates increasing the OAS as well as the CPP. The combined increases would greatly increase the net replacement ratios for all categories of retirees and, in the opinion of the Commission, would result in "over-insurance" with consequent disincentives to save and an unnecessary drain on the taxpayers. All of the programs providing income except GAINS, which operates on a guaranteed minimum basis, are indexed to the Consumer Price Index so that the retiree is fully protected from inflation. While it is true that the OAS will fall behind in terms of the percentage it bears to the average industrial wage, the Commission is against increasing a universal payment in a scheme based fundamentally on meeting a need. It therefore favours an increase in the GIS and does not support the principle that earned

rights or absolute entitlement, apart from need, are a more valid criterion for a government program.

The Cofirentes report also neglects to consider the effect on net replacement ratios of the increases to the QPP it proposes for workers at the lower half of the YMPE. It is true that the combined operation of the programs will prevent a 50 per cent increase in the overall effect of QPP payments because there will be a tax-back effect on GIS payments; but the already high net replacement ratios would be much increased if the same approach were applied to CPP benefits for recipients in Ontario.

The Cofirentes report recommends no change in the OAS, and in effect proposes a decreased dependence on the GIS and an increased dependence on the QPP earnings-related benefits. The Commission is in accord with this approach, but would recommend that any such adjustment between the two programs should first be assessed for the effect on net replacement ratios. It should be noted that some GIS payment is now payable to every category of retired person with pre-retirement earnings up to the average industrial wage.(21) For example, the worker aged 65, retiring January 1, 1979, who had worked at the average industrial wage, would receive monthly GIS benefits depending on his or her marital status as follows:

Single person	\$ 28.28
Married with spouse under 60	125.88
Married with spouse 60-64	114.15
Married, spouse 65 and over	120.30

The Cofirentes approach therefore would not eliminate the GIS for all those receiving only government benefits including the QPP.

The Commission has recommended some increases in the GAINS level so that combined government programs in Ontario would ensure that no one lives below a minimum standard acceptable in our society.

The second goal of continuing in retirement one's pre-retirement standard of living should then be examined to determine if it is being fulfilled, and if not, by whom action should be taken.

The CLC postulates that this goal would be fulfilled if retired workers who earned at the average industrial wage received 75 per cent of their pre-retirement earnings. A 70 per cent portion is often suggested as ideal by those in the private pension industry. Higher percentages would be reasonable for those earning below the AIW.

Looking again at the Commission's net replacement ratio analysis we find net replacement ratios of "available income" for workers retiring in Ontario, January 1, 1979:

	<u>Worked at the YMPE</u>	<u>Worked at the AIW</u>
	(Per cent)	
Single person	63	50
Married, spouse under 60	76.9	61.2
Married, spouse 60-64	91.4	72.6
Married, spouse 65 or over	94.9	75.4

Again, while repeating that net replacement is more meaningful than gross replacement, the Commission is of the opinion that for the married couple(22) the goal of the CLC is already satisfied, and that it is only the single person who fails to reach that goal. The annual "available income" of the single person working at the AIW and retiring January 1, 1979 would be \$5,393. In addition to this after-tax income, a person will usually have some accumulated savings whose capital value will not serve to reduce any entitlement to income supplements. Income from those savings or other sources will add to "available income," since there is only a partial tax-back for income-tested government benefits.

Therefore the Commission concludes that the existing government programs in Ontario have virtually fulfilled the second goal without any reference to employment pension plans. Because the Commission believes that the individual is responsible for choices in retirement beyond a minimum standard of adequacy and that society should not be compelled to make provision beyond that level, the Commission does not favour increasing benefits in the CPP from their present levels. That is not to say that government has no further role in retirement income provision but rather that a social insurance scheme, based on a group pooling principle - with the inherent cross-subsidies and funding difficulties we have seen now existing in the CPP - should not be extended beyond the provision of a minimum standard of adequacy and the range of replacement income now provided.

The Commission therefore recommends that the Government of Ontario resist any move to increase the existing levels of retirement benefits and survivor benefits in the Canada Pension Plan.

Integration of Employment Pensions with the CPP

Methods by which an employment pension plan may be co-ordinated with CPP benefits are discussed in Volume II, Chapter 11. In the view of the Commission, any such integration should continue to be a matter for voluntary action by plan sponsors and their employees, subject only to a degree of regulation by the supervisory authorities. Any accommodation for employment pension plans within the structure of the compulsory government social insurance program (as in the United Kingdom) would accomplish little if anything by way of improved benefits to employees, and in fact has few advocates in this country. Accordingly, we do not recommend any change that would permit opting out of the Canada Pension Plan where an employment pension plan offers equivalent or better benefits.

RETIREMENT AGE

Canada's government programs for retirement income all commence at age 65 with the exception of the Spouse's Allowance, which commences at age 60. In the latter case however, one spouse must be aged 65. Ontario's GAINS program, tax credits and health assistance are also geared to age 65. Under the Income Tax Act the age exemption is granted from age 65.

History reveals how the pivotal age for the elderly was once 75, later 70, and how it gradually fell to age 65. By the early 1970s there was a trend to earlier retirement ages in employment pension plans, especially through collective bargaining. In many industries today the average age of actual retirement appears to be closer to 62 than 65; it may be even lower in the case of plans have a "thirty and out" retirement provision. More recently, we have seen evidence of public support for "flexible" retirement policies - mainly directed against compulsory retirement and toward greater freedom of individuals to continue working, according to their capacities, beyond some assumed "normal" retirement age. These two trends, toward earlier and later retirement, are not contradictory if, as seem obvious, they are reflections of the same general desire of workers to have a greater choice of retirement age. To what extent people will actually take advantage of flexible retirement provisions depends, in part at least, on economic conditions from time to time, and the individual's expectations of retirement income. A continuation of inflation in particular might be expected to lead to a slowing of the early retirement trend and an increase in the number of postponed retirements.(23)

From our consumer survey we find that 60 per cent of the respondents favoured a CPP pension payable on retirement but in a reduced amount for those under age 65. About 70 per cent thought the current practice of paying CPP benefits to those over age 65 who were still working should continue.(24)

The Commission therefore considered the possibility of an option for earlier payment of CPP benefits on an actuarially reduced basis at any age between 60 and 65.

There are a number of issues to be addressed in deciding whether there should be some reduction in the age at which CPP benefits are payable.

a) Social Insurance or Not?

The CPP is part of Canada's social security design, combining with the OAS and the GIS to provide a minimum income floor. The unions and others, on the other hand, see the CPP as a strictly earnings-related, contributory scheme where benefits are bought by contributions and are therefore payable as of right. The CPP is established on a group

principle and embraces several cross-subsidies with an intergenerational subsidy supported on a "social compact" basis between present workers and those of the future.

If the CPP is social insurance, designed to meet "need" then it should be treated as an integral part of other social insurance programs and benefits should be available at the same age as the other programs, with social assistance answering needs of those below the established age (now 65).

If the CPP is an earnings-related scheme under which benefits are payable as a right by virtue of contributions, then we move closer to the private employment pension design and are caught up in the arguments for "flexible retirement."

b) Retirement from Gainful Employment

U.S. social security, normally payable at age 65, is now available at age 62 with a permanent reduction, but is subject to an earnings test⁽²⁵⁾ on the basis that what is provided is replacement of income lost through withdrawal from employment. The earnings test applies until age 72.⁽²⁶⁾ In emphasizing income replacement the U.S. system is closer to a true social insurance scheme than is the CPP.

Originally, both the CPP and the QPP imposed an earnings test for qualification for benefits at age 65 to age 70. The test permitted annual earnings up to \$900 before applying the reduction formula. Administrative difficulties and social pressures led to removal of the earnings test for the CPP in 1975 and the QPP followed in 1977.

Employment pension plans commonly do not provide benefits until an employee actually leaves the employer's service; in most cases pension payments are suspended if the person is rehired. Otherwise, retirement and earnings tests are rare, especially for those taking their pensions at or near normal retirement age. However, employment or earnings tests have appeared in a few large industrial plans in conjunction with certain highly subsidized early retirement provisions (unreduced accrued pensions plus substantial bridging supplements). Comparable early retirement provisions are found in the federal Public Service Superannuation Plan, but without an earnings test. Such arrangements are vulnerable to criticism on the ground that income provided for retirement is often used instead simply to enhance the living standard of some who are still regularly and fully employed. Ethical considerations, however, take second place to the formidable administrative problems that are associated with any test of retirement or earnings. Where such tests have been instituted, their efficacy is difficult or impossible to assess in a reliable way.

The controversy continues over the purpose of income from pension plans. If it is replacement of income lost by retiring from employment,

an earnings test is required. If it is earned as a right, the pension should be available any time at the option of the earner, subject to actuarial reduction. If it is part of a general social design, it should be available at an age suitable to society, without reduction.

c) Bridging the Gap

Many employment pensions are integrated with CPP benefits; some are also integrated with OAS. Where early retirement is available, many plans provide a "bridging supplement" so that amounts equivalent to the benefits from the government programs are paid by the pension plan until the retiree reaches age 65. This "gap" would be of concern if early retirement were elected by a worker at age 62 and the CPP pension were available on a reduced basis. The "gap" could be financed from minimal personal savings; then at age 65 the retiree could expect GIS to replace the amount formerly covered by personal savings. It might be possible to impute the unreduced value of the CPP to the retiree in calculating the GIS entitlement, but the result could be to put the retiree below the minimum floor of adequacy which the social insurance package as a whole was designed to deliver. Whether this choice is seen as different from electing early retirement with a reduced pension under an employment pension plan depends on whether one considers the CPP an integral part of a social insurance system.

d) The Right to Choose Retirement Age

If retirement is in fact an individual responsibility, it follows that the choice of time for retirement also belongs to the individual. Current social pressures along these lines are now concentrated on the upper age restrictions, but flexibility is sought at both ends of the scale. The desirability of early retirement is underlined by the inability of those just under 65 to obtain employment. An argument made to the Commission by miners with shortened life expectancies is also compelling. The Trust Companies Association of Canada (Brief 361) postulates a difference in the right to choose:

"Retirement under government social programs should reflect society's definition of retirement, as distinct from retirement based on employment factors and an individual's own circumstances."

The question again turns on whether the CPP is part of the government social program. If it is, then a definite age should be maintained; the unemployed and those unable to work are more properly covered by disability insurance and social assistance.

e) The Right to Accrue Increased Benefits

If CPP benefits were available at age 62 on an actuarially reduced basis, should the postponement of payment to, say, age 68 mean an increased benefit payable at that time? Postponed payment would result

in sufficient savings to the plan to provide an increase in benefits. However, to the extent that such a provision would increase the work-force participation of those 65 and over, it may not be desirable in a period of high unemployment, particularly in the younger age groups. On the other hand, with the improving health and life expectancies of the group 65 and over, is it better to adopt measures which will extend the period of productivity for this age group?

f) Cost Factors

As well as the social cost of shortening the productive working lives of workers, reducing the retirement age for the CPP would also mean a loss of plan contributions of those workers who retired early. If an earnings test were reinstated, on the theory that the Plan is designed to provide replacement income in retirement there could be a greater demand on the GIS if other sources of income were not available to "bridge the gap." If the age were reduced, accompanied by an actuarial reduction in benefits, there would be no extra cost to the plan other than loss of contributions. The economic effects of reducing the age of entitlement for the CPP is discussed by Pesando in his paper, "Trends in Retirement Age and the Implications for Pension Planning," found in Volume VIII. The Commission's projections of savings to be gained by the reinstatement of the earnings test formerly in force in the CPP are discussed in Chapter 6 of this volume.

Conclusion

After considering all the issues, the Commission is of the opinion that the CPP is part of Canada's social security scheme and therefore any change in retirement age should be in concert with the eligibility age for other parts of the scheme. Since eligibility ages are all now at age 65 there should be no change in the CPP at this time. The Commission does not see a return to the earnings test, despite the possible cost savings, if the age is maintained at 65. Should the age be lowered, use of the earnings test might again be considered.

COMPARISON OF SOCIAL SECURITY IN THE UNITED STATES AND IN CANADA

Often the U.S. Social Security is pointed to as being much superior to the Canadian system. The U.S. Old Age Security and Disability Income program (OASDI) parallels Canada's Old Age Security combined with the CPP. A comparison of the cost of the respective programs shows the following:

Table 2

Social Security Expenditures as Percentage of Earnings Base, Canada and United States

	Canada			United States
	CPP	OAS	CPP + OAS	OASDI
	(Per cent)			(Per cent)
1980	2.86	4.93	7.79	10.11
1990	4.61	4.14	8.75	10.58
2000	5.73	3.60	9.33	10.97
2025	8.83	3.39	12.22	16.40
2050	9.45	2.30	11.75	16.17

Source Table prepared for the Royal Commission, based on the Commission's most probable assumptions for CPP expenditures. U.S. figures taken from Table 6 in an article in the Social Security Bulletin, March 1978 of the U.S. Department of Health, Education, and Welfare, by A. Haeworth Robertson, former Chief Actuary of the Social Security Administration.

Why Is the Cost of the Canadian System Less Than That of the U.S.?

First, the OAS in Canada is indexed to prices, not to wages and salaries. This accounts for falling percentages when OAS is expressed as a percentage of CPP contributory earnings.

Second, the U.S. system was amended in 1977 to decouple the benefit formula for indexing, thus resulting in lower replacement ratios after 1981 and a more stable cost structure.

Third, the U.S. benefits are higher. In 1979 the earnings ceiling in the United States was \$22,900 compared with \$11,700 for the YMPE in Canada. The maximum monthly benefit under OASDI in 1979 was \$550 for a single person, \$825 for a couple, and \$963 for a family. This compares with \$385 single and \$552 for a couple or a family in Canada. A fairer comparison may perhaps be obtained by taking someone with previous annual earnings of \$14,000. The U.S. monthly benefit in 1979 was approximately \$492 single, \$738 couple, and \$861 family maximum. Even allowing for the lower average of earned incomes in Canada, the U.S. benefit level is superior, and not solely because of the provision for eligible children.

In the United States, retirement may take place at age 62, with 80 per cent of the pension otherwise payable. This rule allows pensions to start earlier and is more generous than an actuarial equivalent basis. In the event of death, the U.S. benefits are generally better than in Canada, as follows:

	<u>Percentage of primary insurance amount</u>
Spouse, age 65	100
Spouse, age 60	71.5
Disabled spouse, age 50	50
Spouse with child	75
Each child	75
Dependent parent	82.5

The United States has two features that are less generous:

- The earnings limitation up to age 72; and
- The minimum pension of \$122.00, which is less than Canada's QAS. On balance, however, the U.S. benefits are greater than those in Canada.

The U.S. percentage costs are also greater because the U.S. self-employed worker pays only 150 per cent (or less) of the contribution rate paid by employers and employees.

Finally, the present U.S. population is on average older than that in Canada and projections indicate that this difference will continue.

Table 3

Ratio of Population Age 65 and Over to Population Age 20-64, Canada and United States

	<u>Canada less Quebec</u>			<u>United States</u>		
	Males	Females	Combined	Males	Females	Combined
	(Per cent)					
1975	13.9	17.7	15.8	15.8	21.8	18.9
1980	13.9	18.2	16.1	16.0	22.6	19.4
1990	14.6	20.3	17.5	17.0	24.4	20.8
2000	15.3	21.4	18.3	17.0	24.7	20.9
2025	23.1	32.0	27.5			32.6
2050	25.9	36.7	31.3			33.2

Source Table prepared for the Royal Commission based on the Commission's dependency ratios (Appendix B-2) and U.S. comparisons provided by Laurence Coward.

The ultimate U.S. ratio for males and females combined is estimated to be 34 per cent. The present age-dependency burden in the United States will not be matched in Canada until just after the year 2000. Both the United States and Canada show strong effects of the baby boom on the age distribution, but the Canadian figures remain below those in the United States at all times.

These results depend on the assumptions made as to the future. For example:

- U.S. assumptions show mortality decreasing by 18 per cent from 1976 to 2050, a smaller decline than in Canada.
- U.S. fertility is assumed to decline to 1.65 in 1980 and then rise slowly to 2.1 by the year 2005; lower rates than in Canada.
- U.S. disability incidence is assumed to increase, reaching a level in 1986 that is 33 per cent above the 1977 level; no such adjustment was made in Canada.

Thus we see that a superficial statement that U.S. social security benefits are better than Canada's has little validity. Comparative costs show U.S. costs are greater and these in turn are due to three factors: more generous benefits, a population with a higher average age, and more conservative actuarial assumptions. A precise comparison would involve measuring equal benefits against the cost structure or equal costs against the benefit structure.

APPEALS PROCEDURE

There are two procedures for appealing CPP determinations according to the nature of the question involved, basically whether the question involves contributions or benefits. If an issue is raised with regard to liability for making a contribution or the amount of contribution, the employee or employer may apply to the Minister of National Revenue for a determination (section 28). The decision of the Minister may be appealed to the Pension Appeals Board (section 29). The members of the board are appointed by the Governor-in-Council and must include a chairman and a vice-chairman, each of whom must be a judge of the Federal Court of Canada or of a superior district or county court of a province (section 85). The Board may hear appeals at any place in Canada. An appeal lies to the Supreme Court of Canada with its leave (section 30).

If eligibility for a benefit or the amount of a benefit is raised, an applicant may appeal to the Minister of Health and Welfare (section 83). An appeal may be taken from the Minister's decision to the Review Committee (section 84). The Review Committee consists of three members, one appointed by or on behalf of the applicant, one on behalf of the Minister and a third chosen by the two others. These members receive no remuneration for such duties. A decision of this Committee may be appealed to the Pension Appeals Board with leave of the Board (section 85).

The Pension Appeals Board consisted of 8 members in 1977, 7 of whom were Supreme Court judges of various provinces and one county court judge (board duties are in addition to their regular judicial duties). The judges must be bilingual and undertake extensive travel throughout

Canada to conduct hearings.(27) Three judges constitute a quorum; this requirement adds to the difficulty of organizing hearings.

Between 1966 and 1976 there were a total of 714 appeals to the Minister of National Revenue with regard to CPP contributions, and 88 cases brought before the Pension Appeals Board.(28) With regard to CPP benefits there were 1,629 appeals to the Minister of Health and Welfare from 1970 to 1976 (9 months) and 282 cases brought before the Pension Appeals Board (1966-1976).(29) There are now about 200 appeals a year to the Review Committee.

The vast majority of appeals under section 83 deal with entitlement of the applicant to a disability pension, and a complex procedure has been established which includes medical examination at the expense of the CPP.

A study of the Pension Appeals Board for the Law Reform Commission of Canada (1979) stated that in social security, the guarantee of individual justice, the need for consistency and the importance of speed in rendering decisions appear as essential considerations in any serious reflection upon the reform of administrative procedure. The study found access to information to be unsatisfactory and saw an urgent need to revamp litigation to ensure less delay. With regard to CPP contributions, the entire appeal process takes about 2 years and 2 months; and with regard to CPP benefits, the process takes 2 years and 9 months.(30) The real causes of inefficiency were found to be in the administrative structure itself: the multiplicity of appeal authorities in each area of jurisdiction and their impermanent character. The study recommended abolition of the Review Committee and replacement of the board by a new federal social security tribunal with wide jurisdiction in all social security matters, including CPP, unemployment insurance, and OAS. The tribunal would be 5 to 7 members composed of judges and others, and appeals could be heard by one member.

Problems with the Review Committee procedure in relation to competing claims for survivor benefits have been referred to in decisions of the Pension Appeals Board. Competing claimants may not meet at earlier appeal levels. The board itself has suggested that the Review Committee procedure be eliminated and a direct appeal to the board be allowed (see MNH&W v. Bogle et al., CCH Canadian Employment Benefits and Pension Guide Reports, p. 6448). In MNH&W v. Germano et al., (CCH, p. 6453) the board states, "...perhaps this should be an occasion to review the necessity of such a Committee at least where conflicting claims to a survivor's benefit are being aired. It results in a time and money-consuming effort which is of no apparent benefit."

The Commission has not done a detailed investigation of the CPP appeals procedure. We refer to these matters as appropriate for review when the CPP is next being amended.

NOTES

- (1) Table prepared by Harry Weitz for his study of coverage, reproduced in full in Volume VIII. Readers wishing to use these statistics are referred to comments by Mr. Weitz on the lack of strict comparability between the two data bases used.
- (2) Canada Pension Plan, R.S.C. 1970, c. C-5, as amended, section 6(2).
- (3) Brief 182.
- (4) See Volume III, Chapter 8, for a discussion of the position of women generally with regard to retirement income.
- (5) This illustration sidesteps some of the technicalities revealed by a careful reading of the Act, sec. 48 and 49. One should keep in mind that:
 - a) contributory period as defined in sec. 49 excludes months during the child-raising period in any year when the person's earnings were equal to or less than the YBE.
 - b) the child-rearing dropout is applied to reduce the contributory period (as defined) - before any other dropout - and is equal to the total child-rearing period (sec. 43(1)) less any months already taken into account in arriving at the contributory period. In other words, months of low or no earnings in years when the person's earnings exceeded the YBE.
 - c) the over-65 dropout, if applicable, is a reduction of the remaining months. Low-earnings months are offset, but not those months already dropped under (b).
 - d) the 15 per cent dropout is applied to the remaining months (after applying the first two).
 - e) the 120-month minimum is overriding; no dropout can have the effect of reducing the divisor to less than 120, referred to as basic contributory months. (There is one exception: the case of a disability pensioner - see sec. 43(1)).
- (6) Brief 176.
- (7) Ontario in effect has veto power over amendments to the CPP affecting benefits and contributions because such amendments require the approval of two-thirds of the participating provinces having two-thirds of the population of the participating provinces. Ontario has slightly over 50 per cent of the total population of participating provinces.
- (8) Summarized from letter dated January 12, 1977 from the Hon. James Taylor, Q.C. Minister of Community and Social Services to the Hon. Marc Lalonde, Minister of National Health and Welfare.
- (9) A more detailed description of surviving spouse provisions will be found in the outline of features in Chapter 2, and in Volume I, Chapter 5.

- (10) See Volume I, Chapter 6.
- (11) Revenue Canada, Taxation Statistics 1978 (for the 1976 taxation year). Table 3, p. 50 and Table 4, p. 58.
- (12) See the Commission's analysis of Adequacy of Benefits from Government Programs, Volume I, Chapter 6.
- (13) See Appendix C-4.
- (14) Committee on Financing Benefits of the Quebec Pension Plan and Supplementary Pension Plans; Report, 1978.
- (15) Recommendations R10 to R23.
- (16) Younger if there are dependent children.
- (17) "Dependent child" is one aged 18 years or under.
- (18) See Volume I, Chapter 6, for full discussion and methodology.
- (19) See also Canadian Labour Congress, Brief 304.
- (20) "Available income" is defined as income after tax, plus the value of benefits universally available to those age 65 and over in Ontario such as tax credits. See Volume I, Chapter 6.
- (21) See Tables A-1 to A-4 in the methodology for net replacement ratios in Volume I, Chapter 6.
- (22) See remarks concerning the married person whose spouse is under 60 in Adequacy, Volume I, Chapter 6.
- (23) For a full discussion of the issues involved in retirement age see Volume III, Chapter 15.
- (24) See Report on Consumer Survey in Volume VIII.
- (25) The U.S. social security benefit is reduced \$1 for every \$2 of excess income. Income could be earned up to \$2,760 in 1976 without a reduction, and up to about \$3,500 in 1979.
- (26) To be lowered to age 70 after 1981.
- (27) Pierre Issalys, The Pension Appeals Board, a study of administrative procedure in social security matters, prepared for the Law Reform Commission of Canada, 1979, p. 55.
- (28) Ibid., pp. 94, 114.
- (29) Ibid., pp. 94, 150.
- (30) Ibid., p. 307.

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Chapter 9

Conclusions and Recommendations

CONCLUSIONS

The financial security of the CPP has become a concern for the average working Canadian. In the Commission's opinion this concern is unfounded. The CPP is not bankrupt and will not be by the time the extra population from the post-war baby boom starts to receive retirement benefits, if benefit levels and the funding structure remain unchanged. This is so even with high inflation and a low birth rate. Contributions will have to be increased; but that eventuality has never been in dispute. The timing and extent of contribution adjustments, however, are matters of legitimate and vital concern.

The scheme of the CPP funding is unfolding as predicted in 1964. The latest statutory actuarial report for the plan and the Commission's projections show that in the year 1985 or 1986 benefits will exceed contributions for the first time. This does not mean that contributions need increase immediately when that event occurs. Rather it means that less money will then be available for borrowing by the participating provinces. Interest on the existing fund will continue, and for another five or six years will be available for additional provincial borrowing. For some ten years therefore, there will be no real need to increase contributions for the CPP itself.

That ten-year moratorium offers two major temptations. The first is to increase benefits without raising contributions to the full extent of benefit costs. This would have the effect of reducing the time within which the main decision on contribution increases must be made; but it might be politically attractive in the short run.

The second temptation is to increase contributions (and benefits to the extent necessary to justify politically the increase) beyond the

amounts required on a pay-go basis to supply additional capital for borrowing by the participating provinces at favourable rates. Such increases could be as large as that projected for a fully-funded CPP.

The Commission's recommendations would not only reject both these temptations but would convert the CPP to a design most compatible with a system of social security.

When CPP contributions are required to increase in about 1991, the Commission recommends that the new rates be sufficient to place the plan on a pay-as-you-go basis. The only fund required should be one limited to twice the year's benefit and administrative cost pay-out three years in advance. This would cover any unexpected fluctuations in benefit requirements. The rates should also be set with consideration of the long-run requirements of the plan, and should have a monitoring and adjusting mechanism which will facilitate any necessary changes and avoid disruption of other public and private programs.

The Commission's investment recommendations would replace the present system (which invites the description of "ghost funding") with marketable securities of provincial Crown corporations having tangible and creditable value. The discipline of regular capital markets would discourage unnecessary government borrowing and would also ensure a market rate of return for the plan and a definite schedule for repayment of government obligations.

Since the fund available for investment under the recommended pay-as-you-go design will be small compared with any full or partial funding design, there is no danger that CPP transactions will involve the government in swamping or controlling Canadian capital markets.

Alteration of existing benefit features should also be approached with caution and with full recognition of the cost implications of any changes. The Commission favours the adoption of a child-rearing dropout provision, while realizing it will have an additional cost, because it appears to have such universal support in perception of a social need. On the other hand the Commission does not accept the approach of Cofirentes+ for short-term survivor benefits because it does not believe such an approach reflects social perceptions today.

The problems of today's elderly, particularly women, are not created by inadequate CPP survivor benefits. Their problems have their roots in the economic and social structure of times before the CPP began, and cannot be cured by a sudden increase in these benefits for the near and long-term future. Short-run solutions for problems such as these would be disruptive for the CPP. Since rapid and direct action is required to alleviate the problems of the elderly, such action would be better taken through income-tested programs such as an expanded GIS. It would then be clear that it is today's work-force that is called upon to support today's elderly population.

The CPP vehicle is then left to move steadily towards the fulfilment of its dual role in the government's system of social security: first to provide, along with OAS and GIS, a minimum adequate income for those 65 and over; and second, to assist the worker in preserving into retirement his or her pre-retirement standard of living, by providing a measure of income replacement.

With regard to the latter role the Commission believes that the present CPP level of income replacement ought not to be expanded to the detriment of other vehicles which allow more individual choice and involve less threat of over-burdening future generations with their cost. The Commission's recommendations favour a provincial universal retirement savings plan as well as improvements to employment pensions. In particular the ten years before CPP contributions rise should be used by Ontario to build up the Provincial Universal Retirement System (PURS) by accommodating contributions by both employers and employees to that money-purchase plan. If CPP contributions were to increase dramatically in 1985 or 1986 there would be resistance to the adoption of any scheme requiring further contributions. Ten years of contributions to PURS before changes in the CPP rates would allow a smooth flow of new capital into the private markets. There would also be time for adjustment to a suitable retirement goal, incorporating income to be provided by the CPP, PURS, employment pensions and other retirement savings vehicles.

The 1980s should see the beginning of new approaches to retirement income planning. Ontario is now in a position to adopt measures that will ensure a sound Canada Pension Plan as part of an effective retirement income system.

RECOMMENDATIONS

The Commission therefore recommends that:

The Canada Pension Plan be funded on a pay-as-you-go basis, with a contingency fund maintained at the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance.

The existing combined contribution rate of 3.6 per cent continue unchanged until such time as the existing fund is reduced to the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance.

When an increase in contribution rates on a pay-as-you-go basis is required there be a gradual phasing-in of increases to approximate pay-as-you-go rates by setting contribution rates six years in advance

of such changes, to maintain a contingency fund at all times equal to twice the year's benefit and administrative cost pay-out three years in advance.

Until the existing fund is reduced to the level required by the recommendations, the CPP fund be operated on the Fund C basis outlined in Statutory Actuarial Report No. 6 for the CPP, with actual payment of interest on borrowing to be made after excess funds above the level required to satisfy twice the year's benefit and administrative cost pay-out three years in advance are no longer available for lending to the provinces.

The CPP fund be operated on the Fund C basis so that no repayment of capital of the fund is required from the provinces except on a call basis to satisfy the purposes of the contingency fund.

There be no increases to the benefit formula under the CPP without an increase in contribution rates on a pay-as-you-go basis with a contingency fund to satisfy twice the year's benefit and administrative cost pay-out three years in advance, to cover the full cost of such increased benefits without regard to any excess funds on hand resulting from existing funding procedures.

The investment structure of the CPP be altered to ensure the receipt of market rates of interest on the capital of the fund and to ensure a control of investment through links with normal market practices, by adopting the following procedures:

- a) upon maturity of existing provincial undertakings, commencing in 1986, each obligation be replaced with a twenty-year negotiable bond with a fixed maturity date issued by a provincial Crown corporation, guaranteed by the province and accompanied by a certificate of the treasurer of the province that the proceeds of such bonds are being used,
 - (i) to invest in fixed assets of the provincial Crown corporation, or
 - (ii) to refinance outstanding debt of the provincial Crown corporation originally used to finance acquisition of fixed assets;
- b) the interest rate on such new securities be at the market rate determined by the average rate prevailing in the twenty preceding trading days on outstanding long-term debt issued by

or guaranteed by the province, denominated in Canadian dollars;
or struck by reference to

- (i) the average of interest rates on all outstanding debt issued or guaranteed by participating provinces, weighted according to CPP contributions in the year of calculation, or
 - (ii) the average interest rate on outstanding debt issued or guaranteed by the province concerned, with the treasurer of the province having the right to elect between (i) and (ii);
- c) all funds declined by the provinces in any month be invested in 90-day treasury bills of the province concerned, or of the federal government if no provincial bills are available, until such time as the province takes up the funds against the securities of a provincial Crown corporation as stipulated in a).

The Government of Ontario support the continuation of the CPP on its present compulsory and "earnings-related" basis and resist any extension of coverage to unpaid workers.

The Government of Ontario approve the amendment of the CPP for the child-rearing dropout provision as now legislated, to take effect without delay.

Benefits payable to the survivor of a deceased contributor in receipt of retirement benefits continue to be approximately 60 per cent of the pension benefit of the deceased contributor, and that the Government of Ontario resist any extension of the existing survivor benefits.

The Government of Ontario take no steps to extend the principle of credit-splitting upon dissolution of marriage to create a division of credits during marriage.

Since the CPP is fulfilling the social role required of government by providing, with other government programs, nearly 100 per cent replacement income for those working below or at the Average Industrial Wage, that the Government of Ontario resist any steps to increase the existing levels of retirement benefits and survivor benefits under the CPP, or alter the existing goal of 25 per cent of the Average Industrial Wage for those at the YMPE, and that such benefits continue to be financed by equal contributions by employer and employee.

The earliest age of eligibility for CPP retirement benefits should continue to be age 65, with any future change to be only in concert with all government retirement income programs.

The Government of Ontario consider amendments to the CPP to provide a more effective, less complicated, and less time-consuming procedure for appeals as to both contributions and benefits under the CPP.

All CPP benefits continue to be based on earnings indexed to the Average Industrial Wage, and after payment commences, be indexed as at present to the Consumer Price Index.

No earnings test for retirement benefits be reinstated in the CPP while age for eligibility for retirement benefits remains at 65.

Resource Studies

Comparison of the Royal Commission’s Population Projection Assumptions with those of Statistics Canada

Ann Jamieson

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Comparison of the Royal Commission's Population Projection Assumptions with those of Statistics Canada

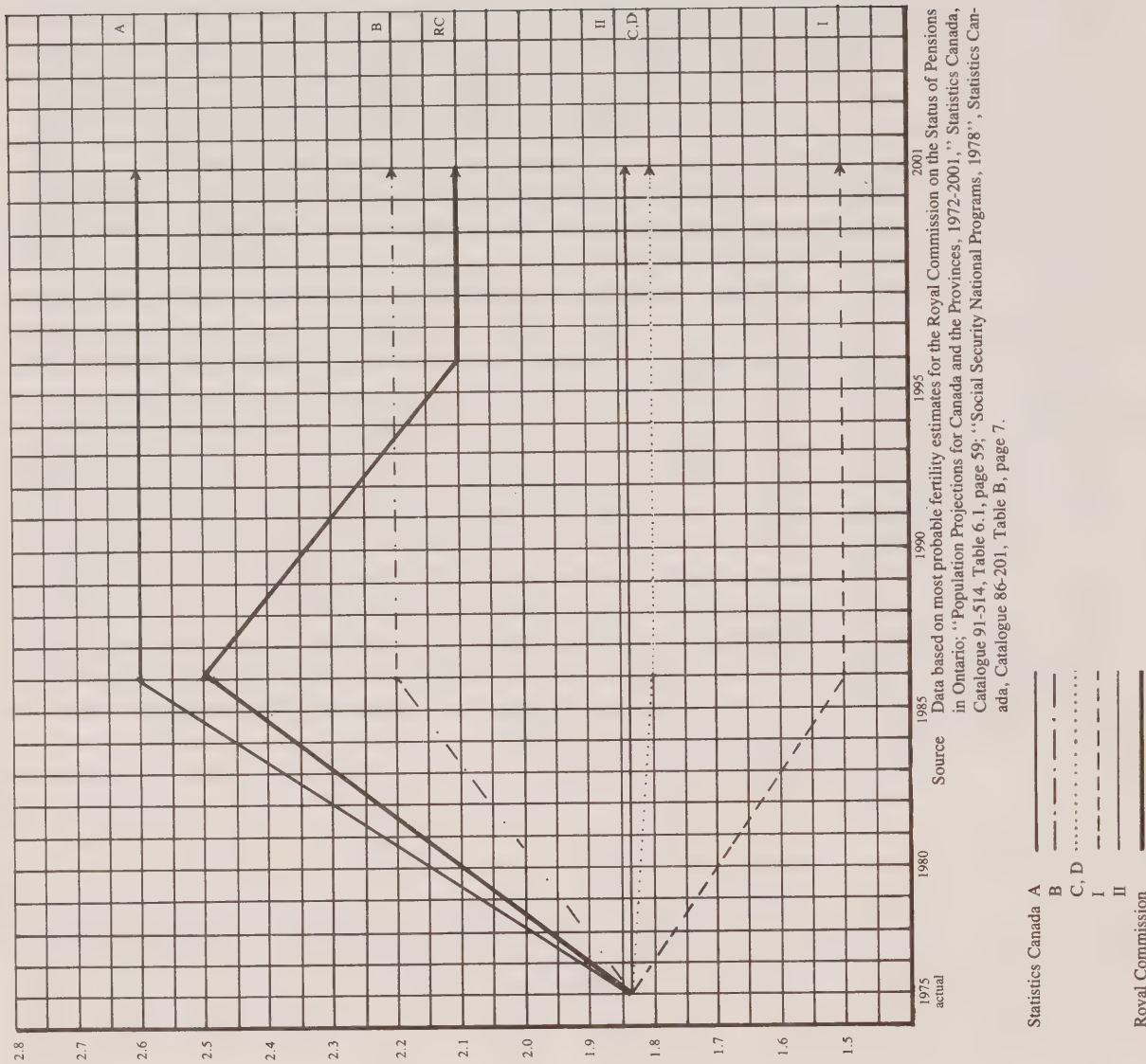
Because many readers will be familiar with population projections done by Statistics Canada(1) we outline the reasons which prompted the Commission to do its own demographic research and to compare the two sets of projections. Principally the Commission felt that the data available through Statistics Canada used too short a time basis for the Commission's purposes; even though the population figures used by Statistics Canada are projected to the year 2001, the fertility assumptions on which they are based remain constant after 1985, and mortality trends end in the 1985-89 period. Since the Commission must apply the results of its work to funding predictions for the Canada Pension Plan, population projections for the longer term are essential. Consequently the Commission chose to carry its assumptions for fertility forward to 1990, for immigration to the year 2000 and for mortality through to 2050. As has been mentioned, the Commission chose what it considered to be the most probable fertility scenario. In this section we compare this choice with the range of scenarios in Statistics Canada's work. These are labelled A, B, C and D in the Statistics Canada population projections. However, two other projections appear in a discussion of dependency ratios to be found in Social Security National Programs, 1978.(2) While fertility assumptions in that study go forward only to 1985 as before, the population figures are available for 2051 and allow for longer-term comparisons with the Commission's work. Since the Commission's projections were done on the basis of five-year intervals ending with "0" and "5", while Statistics Canada uses Census years, "1" and "6", absolute accuracy of comparison is not possible, but the difference is not enough to nullify any comparison of the overall direction of the projections.

FERTILITY

The Commission's projections (described in Chapter 3) are expressed in terms of Net Reproduction Rates(3) while Statistics Canada uses Total Fertility.(4) For purposes of comparison, therefore, the Commission's figures have been converted to Total Fertility: a Net Reproduction Rate of 1 equals 2.112 Total Fertility - that is 2.112 births per female provided she survives to the child-bearing years. A comparison of the various Total Fertility assumptions follows:

Commission: increase to 2.5 in 1985, drop to 2.3 in 1990, drop to 2.1 in 1995 and remain constant thereafter.

Figure 1 Total fertility rates projected to 2001, according to scenarios prepared for the Royal Commission and Statistics Canada.



Statistics Canada:

"A" - increase to 2.6 in 1985 remaining constant thereafter

"B" - increase to 2.2 in 1985 remaining constant thereafter

"C" - increase to 1.8 in 1985 remaining constant thereafter

"D" - increase to 1.8 in 1985 remaining constant thereafter

Projection I - dropping from the 1975 rate of 1.84 to 1.5 in 1985 and remaining constant thereafter

Projection II - remaining at 1.84

As can be seen from Figure 1, the Commission's assumption of a slight increase in the rate does not reach as high as the Statistics Canada "A" projection (high fertility), and drops to a level slightly below the "B" projection (medium fertility).

MIGRATION

a) International

The Commission assumed immigration of 100,000 per year and emigration of 40,000, with the resulting net figure of 60,000 being escalated by .5 per cent per year to the year 2000, at which time it reaches 66,960 and remains constant thereafter. It is assumed that Ontario will receive 50 per cent of the immigrants and lose 40 per cent of the emigrants.

Statistics Canada uses a range of figures for immigration, based on experience, from a high of 200,000 through 160,000 and 120,000 to a low of 80,000 per year. Their assumption of a constant emigration of 60,000 per year results in net figures of 140,000, 100,000, 60,000 and 20,000, and no escalation of these figures over time is assumed. For the projections only the two middle figures are used. The higher of these two (100,000) is used for Projections A, I and II, the lower (60,000) for Projections B, C and D. Statistics Canada assumes that Ontario receives a constant 53 per cent of the total immigration and loses 40 per cent of the total emigration from Canada.

b) Interprovincial

Ontario's traditional position as a net gainer from interprovincial migration is reflected in Statistics Canada's assumptions - the change to a net loser position in the mid-1970s was too recent to have been incorporated into their figures. Their assumptions break out as follows:

- A - high migration, with Ontario gaining 36,218 per year;
- B - medium - high migration, with Ontario gaining 25,435 per year;
- C - medium - low migration, with Ontario gaining 12,712 per year (one-half of "B");
- D - low migration with Ontario gaining 4,500 per year.

As mentioned, the Commission has assumed a net gain of ± 0 for internal migration, based on the swing from gain to loss experienced in recent years.

MORTALITY

The Commission's assumptions, based on the 1971 Census population and U.S. Actuarial Study No. 77 are discussed in Chapter 3. For their projections Statistics Canada used the post-censal population estimates of June 1, 1972 and constructed abridged life tables for Canada.(5) Their broad underlying assumptions coincide with those accepted by the Commission:

- a continuing improvement in life expectancy for both sexes;
- a widening of the gap in life expectancy between the sexes;
- some improvement in infant mortality;
- some increase in violent deaths for males aged 20 and over;
- no allowance for a major medical breakthrough.

The assumptions used by Statistics Canada are common to all their scenarios.

A comparison of the several assumptions appears in the following table:

Table 1
Comparison of Assumptions for Fertility, Migration, and Mortality, for Population Projections Made By the Royal Commission and Statistics Canada

	Total fertility rate	Migration		
		International	Interprovincial	Mortality
Royal Commission	Rising to 2.5 in 1985, down to 2.3 in 1990, 2.1 in 1995 and constant thereafter	Immigration 100,000 per year, emigration 40,000 per year; the net 60,000 rising by .5 per cent per year to 2000. Ontario to have 50 per cent of immigration and 40 per cent of emigration.	Ontario + 0	1971 Census population; 1970-72 Canada Life Table; U.S. Actuarial Report No. 77
A	Rising to 2.6 in 1985	Immigration 160,000, emigration 60,000, net 100,000 per year to 2000. Ontario to have 53 per cent of immigration and 40 per cent of emigration.	Ontario + 36,218 per year.	June 1, 1972 post-censal population figures; abridged life tables constructed.
Statistics Canada	Rising to 2.2 in 1985	Immigration 120,000, emigration 60,000; net 60,000 per year to 2000. Ontario to have 53 per cent of immigration and 40 per cent of emigration.	Ontario + 25,435 per year	See A
B				
C	Rising to 1.8 in 1985	See B	Ontario + 12,717 per year	See A
D	Rising to 1.8 in 1985	See B	Ontario + 4,500 per year	See A
I	Dropping to 1.5 in 1985	100,000 per year to 2000. No stated assumption of Ontario's share.	No mention	No mention
Projection				
II	Remaining at 1.84 throughout	See I	No mention	No mention

Source Royal Commission on the Status of Pensions in Ontario.

POPULATION PROJECTIONS

The cumulative impact of differing demographic assumptions gives us a range of population figures which vary considerably at the years 2000-2001, and dramatically when projected to 2050.

Canada - Total Population

The Commission's assumptions of a slight resurgence in fertility and escalating immigration produce results that fall between the "A" and "B" projections of Statistics Canada. The comparisons set out in Table 2 show a high in 2000-1 of 34.6 million in "A" and a low of 28.2 million in Projection I. When extended to 2050, the low fertility assumptions of Projections I and II yield totals of 26.0 and 33.7 million respectively - well below the Commission's figure of 42.1 million.

Table 2

Projected Population of Canada, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission	Statistics Canada "A"	Statistics Canada "B"	Statistics Canada "C"	Statistics Canada "D"	Projection I	Projection II
				(millions)			
1975	23,259						
1976		23,086.1	22,846.3	22,772.4	22,769.8	22,905.7	22,905.4
1980	24,872						
1981		25,311.5	24,472.5	24,041.4	24,036.2	24,299.9	24,408.1
1990	28,801						
1991		30,177.6	27,902.1	26,591.4	26,582.9	26,672.8	27,463.0
2000	31,596						
2001		34,611.4	30,655.5	38,369.7	28,360.0	28,250.7	29,757.5
2010	34,315						
2011		n/a	n/a	n/a	n/a	29,167.5	31,642.1
2020	36,980						
2021		n/a	n/a	n/a	n/a	29,387.4	33,020.5
2030	38,930						
2031		n/a	n/a	n/a	n/a	28,838.6	33,726.7
2040	40,621						
2041		n/a	n/a	n/a	n/a	27,595.1	33,856.8
2050	42,126						
2051		n/a	n/a	n/a	n/a	26,090.3	33,737.1

Source Royal Commission on the Status of Pensions in Ontario.

Canada - Population 65 and Over

Since the population that will be 65 and over in 2000-1 has already been born, the factors of mortality and immigration are the only ones that will affect the totals. Consequently there is minimal divergence to be found between the various projections. As seen from Table 3, they range from a high of 3,393,200 for "A" down to 3,337,700 for "D." The Commission's figure of 3,384,000 is in the upper range. Projections extended to 2050 naturally show greater divergence: the Commission's figure of 7,458,000 compares with 6,241,000 for Projection II and 5,922,500 for Projection I. The projections produce very similar results over the short term.

Table 3

Projected Population of Canada, 65 and over, 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission	Statistics Canada "A"	Statistics Canada "B"	Statistics Canada "C"	Statistics Canada "D"	Projection I	Projection II
				(millions)			
1975	1,944						
1976		1,975.0	1,975.0	1,975.0	1,975.0	1,971.3	1,971.3
1980	2,237						
1981		2,282.9	2,272.3	2,272.3	2,271.6	2,264.8	2,264.8
1990	2,860						
1991		2,943.5	2,916.0	2,916.0	2,913.5	2,909.5	2,909.5
2000	3,384						
2001		3,393.2	3,341.8	3,341.8	3,337.7	3,358.1	3,358.1
2010	3,973						
2011		n/a	n/a	n/a	n/a	3,881.6	3,881.6
2020	5,358						
2021		n/a	n/a	n/a	n/a	5,180.0	5,180.0
2030	6,712						
2031		n/a	n/a	n/a	n/a	6,406.0	6,406.0
2040	6,771						
2041		n/a	n/a	n/a	n/a	6,236.5	6,229.7
2050	7,458						
2051		n/a	n/a	n/a	n/a	5,992.5	6,241.4

Source Royal Commission on the Status of Pensions in Ontario.

Ontario - Total Population

Figures are available for the short term only since Projections I and II deal only with the total Canadian population. From now to 2000-1 we find the Commission's estimates lying between Statistics Canada projections "B" and "C". The Commission's assumption of +0 inter-provincial movement is the main factor in reducing the projected total. The figures range from a high of 14.6 million for Projection "A" to the low of 11.2 million for Projection "D". Figures for intervening years are shown in Table 4, as well as the Commission's projected totals to 2050.

Ontario - Population 65 and Over

The same condensed time-frame applies as in Ontario's total population projections; however, in these projections we note from Table 4 that the Commission's figure is slightly below any of the Statistics Canada Projections: 1.278 million for the Commission compared with 1.295 for Projection "D", in 2000-1. In any case, the Statistics Canada short-term figures are not helpful for an assessment of the CPP from Ontario's point of view since it is generally agreed that the crucial time is to be expected about 2030. As seen in Table 4, the Commission's projections show a rapid rise in the elderly population after about 2010.

Table 4

Projected Population of Ontario 1975/6 to 2050/1, Based on Royal Commission and Statistics Canada Estimates

	Royal Commission		Statistics Canada "A"		Statistics Canada "B"		Statistics Canada "C"		Statistics Canada "D"	
	Total	65+	Total	65+	Total	65+	Total	65+	Total	65+
	(millions)									
1975	8,432	716								
1976			8,530.7	732.5	8,370.1	729.0	8,343.3	729.0	8,290.1	727.6
1980	9,072	820								
1981			9,672.1	848.9	9,187.7	840.2	9,027.9	840.2	8,904.0	836.7
1990	10,580	1,050								
1991			12,181.9	1,133.1	10,926.5	1,109.6	10,432.8	1,109.6	10,155.5	1,100.8
2000	11,727	1,278								
2001			14,698.0	1,361.1	12,518.1	1,315.8	11,628.7	1,315.8	11,183.2	1,295.3
2010	12,869	1,508								
2011			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2020	13,996	2,012								
2021			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2030	14,896	2,484								
2031			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2040	15,723	2,562								
2041			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2050	16,498	2,857								
2051			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source Royal Commission on the Status of Pensions in Ontario.

SUMMARY

The fact that the Commission's fertility and immigration assumptions produce population figures for Canada toward the upper end of the Statistics Canada range means that we expect a less drastic drop-off in the younger population than is currently predicted in some quarters, and because of the larger numbers of working age we expect dependency ratios in the next century to be a less serious problem than they are regarded in other current works. The size and structure of Canada's population is of crucial importance to the assessment of the Canada Pension Plan. Therefore, in the Commission's opinion, short-term projections such as those of Statistics Canada just discussed were not sufficient for such an assessment.

NOTES

- (1) Statistics Canada, Population Projections for Canada and the Provinces, 1942-2001 (Cat. 91-514).
- (2) Statistics Canada, Social Security National Program, 1978 (Cat. 86-201), Introduction.
- (3) Net Reproduction Rate (NRR) - the probable number of female children each female will have during her lifetime.
- (4) Total Fertility - the probable number of children a woman will have if she survives to child-bearing age.
- (5) Population Projections, p. 21.

A Review and Critical Analysis of the Economic Literature on Social Security

Arthur Donner and Fred Lazar

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A Review and Critical Analysis of the Economic Literature on Social Security

This study focuses on the issue of the optimal funding arrangement for old age assistance programs, such as the Canada and the Quebec Pension Plans (CPP and QPP). This subject is receiving considerable attention in the public and private sectors in both Canada and the United States at this time.

In Canada, many actuaries, economists, and public officials have warned that the CPP may not be financially viable in the 1980s and 1990s. The problem has come into focus because of demographic studies indicating that the average age of Canada's population will rise significantly between the late 1970s and the year 2000. The consensus is that this population aging will necessitate either substantial increases in the CPP contribution rates to maintain the current relative level of benefits or a sharp decline in that level. Otherwise, with the same contribution rates, the existing reserve fund will fall seriously into debt if the current level of benefits is maintained.(1)

Similar demographically related concerns about the funding of its social security system are evident in the United States. But, as well, Feldstein argues forcefully that public pension plans have a substantial negative impact on the rate of private savings. Indeed, his studies and one by Munnell indicate that the pay-as-you-go social insurance system has had a significant negative impact on the level of savings and that the U.S. social security system has led to a marked reduction in the nation's stock of physical capital and hence the productive capacity of the economy.(2)

Under pure pay-as-you-go financing, contributions to the plan are immediately distributed as benefits rather than accumulated in a fund. To the extent that contributors consider such benefits compulsory sav-

ings, they may tend to reduce their rate of personal saving. A private pension fund or a fully funded public pension plan must build up an adequate reserve fund and, in principal, need not have a negative "savings" effect.

While the CPP is not quite as close to a pure pay-as-you-go system as is the U.S. social security system, because of the small contingency reserve fund that is available to finance provincial government debt, the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA), expressed similar concerns about the structure, development, and funding of the CPP in a recent report presented to the Royal Commission on Pensions in Ontario.(3) The report suggested that the public pension system - represented by Old Age Security (OAS), the Guaranteed Income Supplement (GIS), and the CPP programs - has also depressed personal savings in Canada. Indeed, the report showed that between 1952 and 1975 public pensions in Canada lowered the rate of personal savings by 3.1 percentage points. In 1975 this was equivalent to a 22 per cent reduction in the rate of personal savings from disposable income. The study concluded that, in the absence of Canada's public pension system, the personal savings rate in 1975 would have been 13.9 per cent rather than the realized 10.8 per cent. Therefore, there was a \$3.5 billion reduction in the level of savings because of the negative impact of public pensions.

Obviously, then, in view of its terms of reference, the Commission must develop a position on the applicability and usefulness of the literature that is critical of public pension schemes. The following four issues seem to be central to the economic arguments against pay-as-you-go financing of public pensions:

1. the impact of the CPP on the aggregate savings rate of the economy,
2. the relationship between capital accumulation and aggregate economic growth,
3. the economic criteria for a fully funded CPP compared with a pay-as-you-go plan, and
4. the allocation of investment funds under a regime of a fully funded CPP.

Critics suggest that pay-as-you-go financing has resulted in a decline in aggregate savings rates. Such schemes may indeed have reduced the flow of funds available for public investment compared with fully funded investment programs and thus may have lowered the economic potential. This report considers both the theoretical and empirical evidence, with the purpose of framing a position on whether there is a fundamental difference between the impact of a fully funded scheme and a pay-as-you-go system on the aggregate savings rate or, indeed, whether this issue

should be judged as being at all relevant for the Commission. Our study considers whether private pension schemes may not also produce the same savings effects as a public pension plan, particularly if public pension plans complement rather than fully supplement the private plans. The discussion highlights the importance of economic assumptions and their relation to the issue, for if the assumptions are unrealistic, what conclusions can be drawn?

From a social welfare perspective, the TEIGA study argued that the choice of how to finance a social security plan is clear; that is, it should be made on the basis of relative rates of return to savings that are available to the contributors. In simple terms, the funding system that earns the highest rate of return is the one that is desirable and socially optimal. But in order to earn the highest rate of return, it may be necessary to invest the available funds not in government bonds but in the equity sector of the private capital market. Once again, the appropriateness of the assumptions is considered, particularly in relation to the measurements of rates of return in a fully funded and a pay-as-you-go plan. The desirability of equity investment in funded schemes is examined as well.

Finally, if Canada's social security system were organized on a private, fully funded pension basis, it is clear that the concerns over whether social security financing depresses the level of national savings and, in turn, whether a lower level of savings results in a lower real economic growth would not be relevant. Indeed, only one out of the four central issues would remain - the proper rate of return for a fully invested public plan.

The following sections of this report deal with the appropriate funding arrangements for a national pension plan. On the basis of the brief statistical overview of the interplay between savings and investment flows in the Canadian economy, one can intuitively grasp that the statistical significance of the first two issues - the depressing effect of public pensions schemes on national savings and capital stock accumulation - may have been overstated.

A STATISTICAL OVERVIEW OF THE FINANCING OF CAPITAL FORMATION IN CANADA

The aggregate statistics presented here relate directly to the question whether the existence of a public pension system does, in fact, alter an individual's savings decision and in turn lead to a lower level of personal and aggregate savings. When the CPP began in 1966, the personal savings rate in Canada was about 6 per cent of personal disposable income.⁽⁴⁾ The rate drifted slightly downward until the early 1970s when it began to climb, reaching over 10 per cent in 1974 (Table 1). Yet the ratio of aggregate savings or investment to GNP has remained relatively constant over the past twenty-five years. As well, the personal savings ratio has displayed a wider degree of variability than the aggregate

savings ratio over the same period, rising to a fifteen-year high in the mid-1970s.

Table 1
Selected Savings Ratios, 1962-77

	Personal savings rate(a)	Business investment rate(b) (Per cent)	Investment/ GNP rate(c)
1962	5.0	98.5	16.3
1963	4.4	97.3	16.5
1964	4.4	90.0	18.3
1965	6.1	83.0	19.4
1966	6.2	74.2	20.2
1967	6.7	78.0	19.1
1968	5.2	86.5	17.6
1969	4.8	81.7	17.8
1970	5.2	75.3	17.3
1971	5.6	76.0	18.0
1972	7.7	79.1	18.1
1973	8.4	86.6	19.0
1974	10.2	86.0	19.6
1975	10.8	71.2	20.4
1976	10.8	71.2	19.9
1977	10.7	70.9	19.4

a Personal savings, excluding change in farm inventories, as a proportion of personal disposable income.

b Corporate and government business enterprise, undistributed profits, and capital cost allowances as a proportion of gross fixed capital formation.

c Business gross fixed capital formation as a proportion of GNP.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 2-3, 6-7, 28-31; and idem., National Income and Expenditure Accounts, 1963-1977, Cat. 13-201 (November 1978), pp. 6-7.

Much of the variability in the personal savings rate appears to be related to inflationary trends. During periods when the aggregate rate of inflation has been quite low - say, less than 3 per cent - the personal savings rate has tended to be below the fifteen-year average. Over the past half-decade, when increases in the rate of inflation have been in the double-digit range, the personal savings rate has shifted upward quite dramatically, despite the greater income uncertainty (Table 2). During this period, the female labour force participation rate soared faster than expected, and this contributed as well to an increase in the personal savings rate. In addition, federal and provincial fiscal incentives to encourage housing purchases combined with a sharp rise in family formation rates in the 1970s to augment the savings rates. Thus at a rather superficial level, the statistics in Table 2 seem to suggest that

even if the CPP has had a negative impact on the personal savings rate in this country, other factors - inflation, demographic trends, fiscal incentives - have been as important and may even have offset any negative effects.

Table 2

Rate of Personal Savings and Inflation, 1962-77

	Personal savings rate(a)	Inflation rate(b)
	(Per cent)	
1962	5.0	
1963	4.4	1.5
1964	4.4	1.3
1965	6.1	2.0
1966	6.2	3.3
1967	6.7	3.4
1968	5.2	4.1
1969	4.8	3.8
1970	5.2	3.6
1971	5.6	2.4
1972	7.7	7.0
1973	8.4	7.3
1974	10.2	11.0
1975	10.8	10.6
1976	10.8	7.2
1977	10.7	7.4

a Personal savings, excluding change in farm inventories, as a proportion of personal disposable income.

b Annual rate of change in implicit price index for personal expenditure on consumer goods and services.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 2-3, 6-7, 28-31; and Statistics Canada, National Income and Expenditure Accounts, 1963-1977, Cat. 13-201 (November 1978), pp. 6-7.

This raises the further important question whether an empirical study of the relationship between the personal savings rate and the funding arrangements of the CPP, including the other existing elements of old age assistance programs, can distinguish between the effects of the CPP funding and other factors that have changed significantly over the postwar period. The data in Table 3 reveal that personal savings contribute less than 30 per cent of the total supply of savings to the Canadian economy. The principal sources of savings for investment purposes have been corporate retained earnings and capital consumption al-

lowances, which have generated over 60 per cent of the funds required to finance the level of physical capital expenditures undertaken in Canada over the past ten years. Thus, even if public pension schemes had a negative impact on the personal savings rate, unless the effect were substantial - say a decrease in the personal savings rate of 40 per cent or more - the effect on the aggregate savings rate would have been small. Moreover, given the importance of foreign sources of savings, it is conceivable that any shortfall in personal savings might have been supplemented by an inflow of foreign savings.

Table 3

Distribution of Savings and Gross Fixed Capital Formation, by Selected Groups and Periods, 1964-76

	1964-66(b)	1969-71	1974-76
	(Per cent)		
Distribution of savings(a)			
Persons and unincorporated businesses	14.3	15.9	26.8
Incorporated businesses and government enterprises			
Undistributed profits	18.2	17.0	18.1
Capital consumption allowance(c)	26.8	29.5	23.2
Government			
Surplus (deficit)	13.4	15.9	4.9
Capital consumption allowance	5.5	6.4	5.7
Non-residents	6.5	0.0	9.2
Capital consumption allowance - persons and unincorporated businesses	15.2	15.3	12.2
Distribution of gross fixed capital formation			
Persons and unincorporated businesses	22.7	20.9	24.1
Government	18.4	17.8	15.4
Incorporated businesses and government enterprises	58.9	61.3	60.3

a Total savings exclude adjustment on grain transactions, capital assistance, inventory valuation adjustment, and residual error of estimate.

b Three-year average.

c Including miscellaneous valuation adjustment.

Source Statistics Canada, National Income and Expenditure Accounts, 1962-1976, Cat. 13-201 (December 1977), pp. 16-17.

A further issue that arises in this connection and is dealt with more comprehensively later is whether savings lead to investment or investment to savings. The available data cannot, of course, provide an easy answer to this question. As noted later, the answer lies partly in whether a short- or long-run time frame is being considered and whether

or not the economy is moving along a path of full employment of labour and physical capital resources.

In sum, the savings and investment statistics presented in this study suggest

- that there has not been a long-run reduction in the personal savings rate since the CPP/QPP began;
- that even if the CPP/QPP has marginally reduced Canada's personal savings rate, the impact on the aggregate savings rate has been insignificant; and
- that inflation, demographic changes, and fiscal incentives seem to have affected the personal savings rate more than the CPP/QPP.

With these empirical factors in the background, it is possible to examine the theoretical and empirical studies that link the funding arrangements of a public pension scheme, the savings rate, and the rate of physical capital formation. A major concern in this report - the aging of the population in the 1980s and 1990s - becomes basically a question of the explicit and implicit contractual arrangements under the two alternative financing arrangements for public pensions, full- investment funding, and pay-as-you-go financing.

A COMPARISON OF THE IMPLICIT CONTRACT UNDER A PAY-AS-YOU-GO SCHEME AND A PRIVATE PENSION FUND

A private firm must fund its employee pension plan, for this is the only way the employees are guaranteed that their pension earnings will be delivered in the future. A large enough reserve must be accumulated to finance the benefits for all those insured and to provide for an effective real rate of return to savings. The adequacy of the reserve fund is judged by its sensitivity to expected inflow and outflow of the funds. Sufficient funds must be collected from the contributing employees and employers, so that the discounted value of the benefit obligations to be paid in the future would be equal to the current value of the investment fund.

From the perspective of such private funding criteria, the CPP is already bankrupt, since the discounted value of future benefits to be paid out by the CPP are calculated to be far in excess of the CPP fund available today. But the CPP was never designed to be fully funded on the basis described above. A better description of its funding mechanism is that although it is close to a pay-as-you-go scheme, unlike a pure pay-as-you-go plan the CPP has a large contingency fund. But what guarantees a worker contributing to this scheme that his pension benefits will actually materialize?

The underlying rationale is that the worker who is currently in the labour force is indirectly paying for his future CPP retirement benefits by undertaking an implicit contractual agreement with the federal government. That is, he is in effect agreeing to finance payments for those who are already retired in exchange for a commitment that the government will impose taxes on future generations of workers to finance his own retirement pension. Under the framework of a pay-as-you-go plan, no reserves need be accumulated as long as these future commitments are kept. The basically unfunded operation of the current CPP system is defended on the basis of this implicit contract. It also follows that a pay-as-you-go system will provide a worker who contributes to a plan a real rate of return on his contributions that is roughly equivalent to the growth of the national economy. If the national economy advanced at an average real rate of 5 per cent annually, the real return to pension contributions would be 5 per cent a year under constant contribution rates. If the national economy stopped growing, with constant contribution rates there would be no real return to pensioners for their earlier contributions.

Some of the criticisms voiced about the financing of the CPP and its anticipated net drain of funds in the 1980s relate to an uneasy feeling that many Canadians have about its financial soundness. But the view that, by not being actuarially sound, the CPP is in fact bankrupt tends to negate the value of the implicit contract between the Canadian public and the nation's government. Obviously, some have less faith than others that the federal government will raise taxes in the future to finance retirement benefits. Other critics stress that under pay-as-you-go financing Canadians may be unaware that someone is paying for retirement benefits. In our view, the more important arguments against pay-as-you-go financing of the CPP relate to the potential depressing effect that method may have on national savings and the comparatively higher returns under alternative funding arrangements.

Saving, Investment, and Capital Formation: The Theoretical Interaction

A nation's stock of capital increases because of past savings and investment decisions; that is, a part of a nation's production of goods and services is allocated to investment that in principle will increase the capital stock and yield consumption opportunities in the future. A distinction must, however, be made between real and financial investments. A financial investment that occurs when one individual or institution purchases an earning asset involves the direction of funds towards a particular use so as to yield a financial rate of return. A real investment refers to the actual increase in the physical stock of capital goods over time. Real investments are measured in terms of expenditures on equipment, plant, and the residential housing stock, and it is through these investments that the physical capacity of output expands. A real investment has its financial investment counterpart, but an aggregation of total annual financial investment far exceeds the amount of

real investment, though financial investment plays a crucial role in the capital accumulation process.

Thus the decision to invest, to allocate part of the stream of a given output towards capital accumulation, represents a substitution of the present consumption option for a greater future consumption opportunity. Clearly, then, the decision to invest is inherently bound up with the savings decision, and the relationship between savings and investment decisions is integral to understanding macroeconomic developments, both in the short and long runs. The savings decision involves abstinence; that is, the choice of withholding some available income from the consumption stream. It is the investment decision that allocates this available pool of income to physical capital accumulation.

At any time, the physical stock of capital represents the accumulated inheritances of past real investments. These past investments required society to choose between spending opportunities then and spending possibilities in the future. However, if the economy has unemployed resources when choices are being made, the choices are easier. As long as there are unemployed resources, both present consumption and present investment can increase at the same time. Only when society's resources are fully employed must a choice be made between consumption today and investment or capital formation that will yield additional "potential" consumption opportunities in the future.

Alternatively, investment expenditures represent an important part of aggregate demand and, in the shorter run, a certain level of investment expenditures, depending upon the size of the labour force and the productivity of its workers, is required to maintain the economy at full employment. This aggregate demand role for investment may be viewed as a shorter-run role, clearly distinguished from the longer-run role of increasing the productive stock of capital goods.

In sum, the very process of increasing investment spending results in a rise in total aggregate spending (the aggregate demand role) and an increase in productive capacity (the aggregate supply role). Thus investment spending is much different than consumer spending, since the latter expenditures only affect supply decisions in an indirect fashion.

NEOCLASSICAL GROWTH MODELS AND THE APPROPRIATE LEVEL OF SAVINGS

As noted in the previous section, investment or capital accumulation serves two roles in the economy: 1/ investment, as an element of spending, affects the level of aggregate demand; and 2/ investment that results in additions to the capital stock affects the potential "supply" growth rate of the economy. Our concern in this section is its latter role: the role of savings and investment as they relate to the long-term real growth rate of the economy.

If one accepts the proposition that growth in demand is positively related to growth in investment and, in turn, growth of supply is related to the level of investment, one reaches the basic conclusion of the neoclassical growth models. These growth models postulate that when the growth of aggregate demand is equal to the growth of supply, the rate of growth of output and investment is approximately equal to the aggregate savings rate divided by the capital/output ratio.⁽⁵⁾ Investment and capital stock growth rates are positively correlated with the savings rate, and in the short run they increase together. However, as the growth rate of the capital stock begins to exceed the growth rate of the labour force, the increase in the capital/labour ratio brings about decreasing returns to the additional capital stock, and eventually the increased capital/output ratio offsets the increase in the savings rate and returns the growth rate of the capital stock and investment back to the natural, long-run equilibrium growth rate.

The natural growth rate of the economy is determined by the sum of the growth rates of the labour force and productivity, and in the long run such growth is independent of the savings rate. Changes in savings propensities will only have a short-term effect on the growth rate, though over the longer term the capital/labour ratio and the level of output per capita will increase with higher savings rates. Consequently, even though changes in the savings rate cannot alter the long-term equilibrium growth rate of the economy in the neoclassical growth models, the savings rate can determine the per capita output levels for the system. Hence, in the growth model, an inadequate level of savings translates into a suboptimal level of output and consumption. This conclusion is at the heart of much of the debate on the depressing effect of pay-as-you-go social insurance schemes on national levels of savings. But while a higher savings rate increases the capital/labour ratio and output per capita over time, consumption during the short-term adjustment period is reduced. Thus a 100 per cent savings rate is not optimal; nor is a savings rate of zero.

Phelps has developed a "golden rule" of savings, arguing that if intertemporal and intergenerational utility comparisons are ignored a savings rate exists that will result in optimum per capita consumption over time.⁽⁶⁾ This optimum savings rate and concomitant optimum capital/labour and capital/output ratios are reached when the profit rate (profit per unit of capital) equals the natural growth rate of the economy. When the profit rate exceeds the natural growth rate of the economy, the capital stock is suboptimal; when the profit rate is lower than the natural growth rate of the economy, the capital stock is superoptimal. Thus in Phelps's framework, the savings rate and the growth rates of investment and the capital stock are not optimal whenever the profit rate is not equal to the natural growth rate of the economy. Much of the debate on the optimal savings rate in a growth model can be traced back to this argument.

But Samuelson has argued that Phelps's golden rule and the golden path of capital accumulation are not necessarily optimal from the point of view of the current generation, which may have to forgo some consumption in order to increase the savings rate when the rate is suboptimal. (7) Thus it is necessary, in order to determine the most desirable level of savings from the point of view of the current generation, to compare future per capita income and consumption with their present levels. Samuelson concluded that if the divergence between the present and the golden rule savings rate is small and the planning horizon is quite long, then it is desirable to adopt policies that will in effect curtail consumption in the present period and increase the savings rate within a short period of time to the golden rule level. However, if the divergence between present and optimum savings rates is rather large and future incomes are discounted quite heavily, then the present optimum savings rate may be, and in fact is likely to be, lower than Phelps's golden rule value.

It appears, then, that the simple neoclassical growth model provides us with a criterion for determining whether or not the present savings rate is desirable in a timeless framework. But the necessity of making intertemporal utility comparisons leaves a policy-maker with no sound basis for determining whether or not the present savings rate is too low. The apparent "unambiguous" claim that the savings rate is at its optimum value when the profit rate equals the natural growth rate of the economy is, upon closer inspection, ambiguous when the consumption and saving preferences of the current generation are considered.

Even on the basis of the very strict assumptions in the neoclassical growth models, it cannot be argued that there is a single optimum savings rate that should be the target for policy-makers. When the assumptions implicit in the growth models are closely inspected, the irrelevance of the concept of the optimum savings rate becomes clear. Several of the more stringent assumptions that reduce further the applicability of these models as tools for policy-making are:

- While savings and investment decisions are made by a large number of possibly separate individuals, decisions are co-ordinated through the operation of the interest rate; in effect, the interest rate determines the investment rate.
- The economy is always operating at full employment.
- The economy is generally assumed to be closed; that is, there are no international flows of financial capital and no foreign trade.
- Finally, various types of capital can be aggregated into a single homogeneous measure and thus a single profit rate can be determined for the economy.

Let us consider each of these assumptions in turn.

It is obvious that the assumption about the interdependence of savings and investment tends to run counter to the basic Keynesian framework for an underemployed national economy. It also appears to be inconsistent with the importance of business-generated savings for the financing of investments. In the simple Keynesian framework, we encounter the famous paradox of thrift; that is, a higher level of savings will result in a lower level of consumption, and the lower level of aggregate demand will, in turn, lead to lower levels of investment and income. In equilibrium, in the simple Keynesian model, the higher savings rate will eventually lead to a lower volume of savings as well as to a lower volume of investment and income.

In contrast, in the neoclassical growth models, the higher the rate of interest the lower the level of investment and, conversely, the lower the rate of interest the higher the level of investment. In this framework, by increasing the flow of funds available for investment, a higher volume of savings will drive down the interest cost of the investments. This will in turn increase the desired capital stock and generate a higher flow of investment. By ignoring the "animal spirit of capitalists" and the importance of sales expectations in influencing the investment decision, the notion of the impact of a higher savings rate on the long-run capital stock in the neoclassical model is inconsistent with the Keynesian framework and the predominant reality.(8)

Indeed, it is more plausible to argue that a lower level of consumption resulting from a higher level of savings will adversely affect sales expectations on the part of the business community and over time lead to lower levels of capacity utilization, lower rates of return on capital, and lower levels of investment. It is also more reasonable to postulate that the rate of investment and the subsequent rate of growth of the economy will determine the level of savings, rather than the reverse. Marglin has advanced this view that the level of investment determines the rate of savings as the basis of his alternative theory of consumption and savings.(9)

The reversal of the cause and effect roles between savings and investment between the long-run neoclassical model and the short-run Keynesian framework becomes sharper when considered in the context of the full-employment assumption of the neoclassical models. It is conceivable that, if full employment were continuously being achieved, expectations for investment would then be favourable and the availability and cost of funds would dictate the actual level of investment. However, when the economy is not operating at full employment, the principal constraint on the level of investment is not the availability or the cost of funds but the attractiveness of new investment ventures. During periods of sluggish economic activity, low levels of capacity utilization, and high levels of uncertainty, the profit expectations associated with an investment venture are likely to contain a high-risk discount factor

that reduces the attractiveness of most investment opportunities. A modest change in the rate of interest is highly unlikely to compensate for the high discount factor in such periods. For example, if a firm assumes a risk discount factor of 10 per cent in attempting to calculate the present net worth of future profit flows associated with a particular investment project, an assumed decline of 1 percentage point in the prevailing rate of interest, say from 10 per cent to 9 per cent, amounts to only a 5 per cent decline in the overall discount factor - the rate of interest plus the risk premium. Obviously, the greater the risk premium the smaller the effect of changes in the rate of interest on present value calculations undertaken in evaluating and comparing investment opportunities. If a simple pay-off period rule were adopted by firms, changes in the rate of interest would have little bearing on the pay-off period. More likely the expectations and attitudes of the business community about their future sales levels and profitability would be much more important in determining the length of the pay-off period than would the rate of interest.

Since over the past twenty-five years in Canada the economy has operated within a full-employment zone for no more than three to four years, a less than full-employment assumption seems to be the more appropriate one to use when evaluating the relationship between investment and savings. In such situations not only are expectations more important in influencing the level of investment activity and hence the rate of growth of real GNP (and the resulting volume of savings), but at the same time there is no need to sacrifice consumption in order to free funds for investment spending. Resources can be put to work to produce both consumer goods and capital goods without forcing substitutions between production of different groups of commodities.

The relationship between investment and savings, as postulated by neoclassical economists, breaks down even further if we assume an open economy with a free flow of trade and financial capital between the Canadian economy and the rest of the world. The Canadian economy is clearly open, having no foreign exchange controls. And although the Foreign Investment Review Agency (FIRA) was set up to serve as a screening device and hence as a barrier to the inflow of capital, it has not proven to be much of a deterrent.

In the extreme case of perfect financial capital flows among countries, the domestic rate of interest in a country would exactly equal the international rate of interest, allowing for risk differentials, exchange rate differences, and expectations about future movements in exchange rates. Moreover, the domestic rate of interest would be determined, even accepting the remaining neoclassical assumptions, not by the flow of savings and investment within the country, but by the flows of savings and investment internationally. In such a case, a higher level of domestic savings would not necessarily lead to a higher level of domestic investment if the profit opportunities were more attractive elsewhere.

In a more plausible situation in which it is assumed that there are impediments to international financial capital flows, the aggregate level of investment in Canada would be more dependent upon domestic and international business expectations of sales, demands, and profitability in Canada. If, for some reason, Canada were to become a more attractive place than other countries in which to invest, then savings would flow into the country from abroad to make up any deficit in the level of finance that might occur domestically. Once again the level of investment would generate the savings flow necessary to finance the capital expenditures.

Turning our attention to another matter, we note that neoclassical growth models have focused primarily on physical capital accumulation and have ignored to a large extent investment in non-physical capital, such as human capital. The introduction of human capital into the analysis complicates growth models in at least two ways. First, the link between savings and investment becomes more direct on a personal level and cannot necessarily be monitored with statistics. A significant proportion of the savings undertaken by individuals is generally geared towards investments in themselves; that is, in the enhancement of human capital. Thus, the desired level of human capital accumulation to some extent determines the level of savings that will be undertaken by individuals.

The second complicating factor that arises when introducing human capital into the analysis is the index number problem. While growth models can be developed in one-commodity and two-commodity worlds so that the problems of aggregating the capital stock are minimized, the introduction of an alternative form of capital that is not directly comparable to physical capital makes it more difficult to aggregate the capital stock to come up with one distinct measure and one corresponding rate of return on capital. In other words, if the capital stock cannot be measured in terms of a single-commodity unit, then there is no sense to the statement that there is a distinct rate of return per unit of capital.

The introduction of human capital also raises the question whether the accumulation of physical capital adds more to achieving the desired output per capita value than does an increase in human capital. Let us assume that the physical capital and the adjusted labour supply are initially increasing at the natural growth rate. Then, as a result of some specific government action, the savings rate is increased. Would the effect of an additional sum spent on physical capital accumulation be greater or less on the achievable output per capita level than the effect of an equal sum spent on the rate of investment on human capital?

Standard neoclassical theory provides us with no insights into this particular question. However, studies concerned with the so-called residual explanation of economic growth, such as those by Denison and Wilson and Lithwick seem to provide some answers.⁽¹⁰⁾ These studies, which attempt to account for the portion of the rate of real growth that

cannot be explained by increases in the quantities of the factor inputs, primarily labour and capital, have uncovered the fact that the unaccounted factor or residual of economic growth is quantitatively much more important than the rate of physical capital accumulation. Generally, while the rate of growth of the capital stock has accounted for between 15 and 40 per cent of the overall rate of growth of real GNP, the residual has generally accounted for 50 per cent or more of the overall rate of real growth.

Among the principal factors explaining the residual are improvements in the quality of the inputs, and particularly improvements in the quality of labour, as well as those in the organization of production. Superficially, such studies imply that enhanced human capital will contribute much more to Canadian economic growth during the short-term adjustment period than would an increase in the physical capital stock. But it is possible that a significant proportion of the so-called residual is embodied in the physical capital stock. If technological progress is included in the capital stock measure, a low rate of growth of physical investment will quickly lead to a lower rate of real growth and truly a smaller role for these residual factors. It is likely then that studies of the Denison type have underestimated the short- to medium-term impact of physical capital accumulation on the growth rate of the economy.

Finally, several ambiguities have crept into the analysis, especially in the measurement of the profit rate and the so-called social rate of return on capital. Robinson, a staunch critic of neoclassical economics, has persistently attacked the notion that a single measure of the capital stock can, in fact, be determined and that as a result there can be no such thing as a profit rate or rate of return on capital.⁽¹¹⁾ Without going into the complexities of her analysis, her main criticism is predicated upon the index number problem of aggregating heterogeneous commodities into a single measure. The critical question in this type of aggregation process is what weights should be used in the aggregation. Unfortunately, economic theory establishes no clearcut rules for determining the optimal weights to be used.

While Robinson's critique invalidates to a considerable extent the notion that there is a single rate of return on capital, this problem can be circumvented by measuring the capital stock and the rate of return in dollar terms. This procedure may not be theoretically correct, but it is widely used and serves as the basis for determining the rates of return that have been widely quoted and used in both theoretical and empirical discussions of the optimal financial arrangements for social insurance plans.

Feldstein has used such rates of return to support his contention that the levels of savings and capital accumulation in the United States are suboptimal. According to him, the private rate of return is in excess of the after-tax yield to savers and because of this wedge between

return to investment and return to savers there has been an inadequate level of savings. The inadequacy of savings that occurs as a result of this differential in rates of return and rates of interest is a result of government intervention in the capital market, and the U.S. social insurance system represents one component of this intervention. Consequently, instead of dispensing with the social insurance program, Feldstein argues that changes in the tax treatment of income from capital would appear to be more appropriate.(12)

However, there remains the question of the extent of the differential between the return on capital and the return to savers. The data used in constructing these rates of return were not calculated on the marginal investments undertaken in the economy but were averaged over a large number of firms.(13) Consequently, if the supposition is made that the marginal product of capital declines as the capital stock increases and that, in turn, the rate of return to capital in equilibrium is equal to the marginal productivity of capital, the average rate of return would likely be in excess of the marginal rate of return. Further, it is the marginal rate of return that is relevant for comparisons between the rate of return on investment and the rate of return to savers. If the marginal rate of return is truly below the average rate of return, the real gap - if it exists - must be smaller than that calculated by Feldstein. In addition, the private and social rates of return at the margin would be lower than estimated by Jenkins with Canadian statistics.

To summarize the main points raised in this section:

- This concept of an "optimum" savings rate is embedded in the neoclassical literature describing the long-term economic growth prospects for a very simple economy.
- The optimum savings rate is defined as the ratio of savings to output that would maximize consumption opportunities over time. In these models, a higher savings rate within limits leaves the long-run growth rate of the economy unchanged but results in higher levels of per capita consumption.
- These models imply or assume that savings lead to investment, not vice versa; the economy is fully employed; generations of people will never change their savings, investment, and consumption decisions; there is no international trade and no foreign capital flows; and the well-known law of "diminishing returns" applies to physical investment.
- The long-term neoclassical growth model and its notion of an optimum savings rate are interesting intellectual tools, but make little sense when compared with the realities of the Canadian economy. In Canada's case, underemployment rather than full employment has tended to predominate; consumption and investment

may be increased simultaneously; investment determines savings, rather than vice versa; and finally, Canada's economy produces both goods and services. At least 50 per cent of our GNP is produced by the service sector, while an additional 25 per cent is derived from foreign trade.

In our view, then, the neoclassical growth models cannot be applied to the reality of the Canadian economy. These simple models describe a mythical situation, and the concept of optimum savings derived from them provides little help to Canadian policy-makers facing an economy that is vastly more complicated. In the growth model world, a significantly higher savings rate would result in a higher future standard of living. In Canada's case, a higher savings rate would reduce consumption and lead to lower growth rates and higher unemployment.

SAVINGS AND THE LIFE-CYCLE HYPOTHESIS

Just as the empirical findings about social security financing and levels of national savings are ambiguous, the life-cycle hypothesis of individual saving and spending provides a rather tenuous foundation for empirical studies. The life-cycle model, which originated with Ando and Modigliani was, in fact, based upon a simple two-period model of saving and consumption expounded by Fisher.⁽¹⁴⁾ In Fisher's model, individuals work during the first period of their lives and do not work during the second period. They are fully aware of the rate of interest that their savings will earn during the first period, and hence their decision on saving and spending involves determining the optimal amount of time they should work during the first period and the optimal level of savings they should accumulate to provide them with an income during the second or retirement period. In this simple framework, individuals save during their working years and dissave during their retirement years. Ando and Modigliani extended this simple two-period model to cover an arbitrary number of periods. In their model, the average individual is expected to dissave during early years in the labour force, save during the middle and later years in the labour force, and dissave during the retirement years. Thus saving is a means of smoothing out the stream of lifetime consumption.

Feldstein applied this life-cycle framework to postulate that a social security system has two offsetting effects on the level of savings during the pre-retirement period: "(1) it reduces personal saving because it substitutes for household assets, but (2) it also increases personal savings because it lengthens the period of retirement over which accumulated assets will be spread. The net effect of the pension depends on the relative strength of these two forces."⁽¹⁵⁾ Since Feldstein, who is the most ardent supporter in the United States of the view that the social security system has significantly lowered the aggregate savings rate and in turn the level of capital formation, cannot arrive at an unambiguous conclusion about the relationship between the social

security funding and the savings decision, we are compelled to question whether the life-cycle model is a useful theoretical tool. If we accept the life-cycle model and apply it to an economy with a population growing at a constant rate with a constant age distribution, the implications for aggregate personal savings are that the sum of the savings by individuals will be exactly offset by the sum of the dissavings of those who have retired. That is, if we rule out a desire by individuals to leave an estate, then each individual's lifetime savings will be equal to zero, and hence there will be no aggregate savings.

But this conclusion obviously does not hold if there is an incentive on the part of individuals to save in order to leave an inheritance for future generations. This is important, for if the major impact of a public social security plan is to reduce the level of savings during the pre-retirement years, then one can rightly argue that the total effect will be to leave the zero net lifetime level of savings unchanged, since the level of dissaving during retirement years will be reduced. Even if we have a situation in which estates are to be left and personal savings are in aggregate positive, the effects of a fully mature social security system will be to leave the positive level of savings unchanged. This conclusion holds for mature social security systems whether the plan is pay-as-you-go or fully funded. Hence from a theoretical point of view, and based on the life-cycle model, for a social security system to have an adverse impact on the aggregate personal savings rate, there must be either a change in the age distribution of the population and/or personal differences in desires to leave estates for future generations.

A second question that arises in conjunction with the use of the life-cycle model is whether or not it is superior to what Marglin has labelled myopic decision rules that have nothing to do with lifetime optimization.(16) In effect, is the life-cycle model, or its cousin the permanent income hypothesis, superior to the simple Keynesian consumption function theory or the more sophisticated relative income hypothesis postulated by Duesenberry?(17) Unfortunately, this issue cannot be resolved empirically, as the evidence does not overwhelmingly support the life-cycle or permanent income hypothesis or the relative income hypothesis. If the latter theory is indeed more relevant for describing the savings-consumption decision by individuals, then there is no basis for arguing that a social security system can, in fact, alter the savings decision and have a possible negative impact on the aggregate savings rate. This is a fairly important point to keep in mind, for the empirical findings of Feldstein and Munnell are only valid if one accepts the underlying life-cycle model.(18) If one rejects that model and accepts in turn the supposedly less rigorous relative income hypothesis, then there is no theoretical basis for including some measure of public pension wealth in explanations of national consumption.

Marglin, in criticizing the life-cycle hypothesis, correctly pointed out that "it is too general to be contradicted by any conceivable empirical evidence, and therefore too general to be confirmed."(19)

Moreover, he argued, "in an uncertain world, 'lifetime' resources must necessarily be a subjective, unmeasurable magnitude subject to continued revision by decision makers, whose consistency over time with the axioms of revealed preference is in principle unverifiable." In other words, given the high degree of uncertainty associated with future incomes as well as future rates of return, individuals who adopt a life-cycle attitude towards savings and consumption must, of necessity, apply a high discount rate to future incomes in order to allow for the considerable risk associated with the future. Therefore, current consumption is, to a large extent, dependent upon current income and expectations of incomes one or two periods into the future. Consequently, as Marglin has emphasized, "the lessons of the life-cycle and permanent income hypothesis at most that current consumption is not determined by current income alone, the hypothesis which (as Friedman points out) no one would maintain in its pure form unless he expected to find orgies of consumption on pay days and abstinence at all other times."(20)

Thus, in light of the theoretical inadequacies of the life-cycle hypothesis, one must be sceptical of the results produced from the econometric analyses using this hypothesis as a basis for estimating the impact of public pensions on national savings and consumption.

THE MIXED EMPIRICAL FINDING ON THE IMPACT OF SOCIAL SECURITY FINANCING AND NATIONAL SAVINGS

Just as neoclassical growth theory, when examined carefully, is inconclusive on what should be the appropriate level for the national savings rate, there is no clear consensus about the impact of public pensions on aggregate savings.

The studies of Katona and Cagan concluded that persons covered by private pension schemes saved more than individuals who were not covered by such pensions. Neither Katona nor Cagan used the life-cycle hypothesis as a basis for specifying their structural relationships. Cagan analyzed the 1958-59 savings behaviour of more than 15,000 Consumer Reports subscribers and attributed the results to a recognition effect: participation in the pension plan calls attention to retirement needs and leads individuals to increase provisions for retirement.(21) Katona gathered survey data from personal interviews with approximately 2,000 families in 1962 and 1963 and, like Cagan, found that pension plans increased personal savings.(22) Katona's explanation of this phenomenon was that pension plans make retirement goals feasible and that workers both raise their retirement income goals and intensify their savings efforts. Thus both of these studies suggested that individual preferences for future versus present income is changed by participation in a pension plan as workers choose to reduce consumption or correspondingly increase savings during their working years in order to finance increased consumption during retirement.

Feldstein used the life-cycle framework for his study on the statistical relation between aggregate consumption and income, corporate retained earnings, non-social security wealth, and a constructed social security wealth variable in the United States for the 1929-71 period, excluding the war years. In this study, Feldstein concluded that social security wealth reduced the level of personal savings in 1971 by about 50 per cent. He estimated that this reduction in the savings rate reduced the U.S. capital stock by between 40 and 60 per cent in 1971 and this, in turn, resulted in a reduction in GNP of between 11 and 15 per cent.(23)

Munnell, using longitudinal data collected by the U.S. Department of Labor over a five-year period from 1966 to 1971, tested the life-cycle hypothesis for a sub-sample of employed male heads of households who were between 45 and 59 years of age in 1966. Without going into the details of her various tests, Munnell concluded that her results support Feldstein's contention and "directly contradict the findings of earlier studies by Cagan and Katona that persons covered by private pensions saved more than those not covered. This study, however, differs from earlier ones in important respects which may explain why previous efforts have failed to pick up the effect found here. We have focused solely on the saving behavior of the heads of households in the pre-retirement years. For these people, providing for retirement is the primary saving motive, and, therefore, these should be the people whose savings behavior is most sensitive to pension coverage."(24)

Barro has further complicated the issue by presenting empirical evidence that the social security system in the United States may not affect the level of personal savings at all. According to him, the intergenerational transfer through the social security system may be offset by voluntary transfers as the aged leave larger bequests or receive less support from their children.(25)

In Canada, the empirical findings have been just as ambiguous. In an attempt to replicate Feldstein's findings in a Canadian setting, Ilkiw modified Feldstein's structural relationship and observed that from 1952 - the year the universal Old Age Security program was introduced - to 1975, the personal savings rate in Canada fell a total of 3.1 percentage points, or 22 per cent. This reduction in personal savings translated into an 8.1 per cent reduction in the level of Canada's capital stock, according to Ilkiw.(26) But his analysis neglected the fact that, whereas the social security plan in the United States is a pay-as-you-go scheme, the Canada Pension Plan is a partially funded system. On the other hand, Pesando and Rea, though they did not undertake a detailed empirical study of the question, concluded that "for Canada, there is no evidence at the aggregate level that the introduction of the CPP and QPP has reduced private saving."(27)

In light of these mixed findings, what conclusions can be reached? From an empirical point of view, it is unlikely that the issue will be

resolved adequately one way or the other, since there is no comprehensive theoretical base for completely specifying the structural form of the relationship to be estimated. In addition, one encounters in such studies a serious problem of parallel movement between the two important savings determinants - income and wealth. As a result, it is difficult to have much confidence in the estimated value of the coefficients. Moreover, it is interesting that, while Feldstein estimated the dollar effect of social security wealth on the aggregate savings in the United States, he did not duplicate this exercise for non-social security wealth. One could also argue that non-social security wealth has resulted in a decrease in the aggregate level of savings and hence a reduction in the level of the capital stock in the United States. That is, in the context of the life cycle, a dollar of wealth, whether it stems from a social security plan or private savings, should have the identical impact on the level of consumption and savings.(28)

There are other serious problems with the Feldstein form of analysis that may further invalidate such findings. The size and statistical reliability of the regression coefficients in the estimating equations are sensitive both to the equation specification in the model and the time period of estimation. Moreover, the social security wealth variable, the crux of the measurement issue, may well be a proxy for other factors that have changed during the period since the introduction of social security. In addition, differences in the composition of the samples make comparison among studies extremely difficult. The findings of Munnell, Cagan, and Katona may have all been valid for the particular group that they tested, but this does not mean they apply universally to all groups.

Professor William R. Waters, in a paper presented to the Canadian Pension Conference, warned of these mixed empirical results:

"Sophisticated statistical tests [in the United States] have both confirmed and rejected the hypothesis that individuals have substituted this retirement income for other forms of wealth accumulation. To its credit, the Ontario Government has undertaken similar tests using Canadian data. However, the dramatic changes in our economy over the period for which data exist, and the brave assumptions necessary for statistical analysis of this sort, suggest that policy decisions in this area need to be based on something other than the results of such analyses." (29)

We tend to agree with his interpretation. There is so much ambiguity in the empirical studies undertaken in both countries, and so little general confidence in the "theoretical" and "practical" usefulness of these empirical results, that the issue should at best be bypassed as a means for evaluating the appropriateness of the pay-as-you-go financing approach of the QPP/CPP and OAS plans. Thus we suggest that it is necessary to look elsewhere for clues to determine whether a pay-as-you-go

or a fully funded social insurance system is preferable and to decide what is an adequate level of savings.

GROSS INVESTMENT AND ECONOMIC GROWTH: THE EMPIRICAL EVIDENCE

Let us consider the question whether Canada is in fact investing too small a proportion of its gross national product. Statistics gathered by Lesnoy and Hambor provide some support for the argument that a higher level of investment relative to GNP leads to a higher level of real growth. The authors note that between 1950 and 1962 there was a correlation of .58 between the investment/GNP ratio and the rate of growth of productivity for a sample of seven industrial countries. The positive correlation declined to .36 when the comparison was expanded to include eleven industrial countries. If, however, the observations for Japan and the United States are excluded, the positive correlation disappears entirely and, in fact, becomes marginally negative. This suggests that there are possibly some spurious factors accounting for the high level of productivity growth in Japan and the relatively low level of productivity growth in the United States that are totally unrelated to the rate of capital accumulation in these two countries.(30)

The data in Table 4 provide further evidence that the rate of capital accumulation in Canada may not be out of line with performance in other countries, including Japan. In 1960 Canada's comparative investment/GNP ratio ranked near the bottom among the nine nations, but even then it was only marginally below the ratios recorded by most countries other than Japan. But, in fact, is it total investment that contributes to productive growth or is it only private sector investment in non-residential construction and machinery and equipment? While investment in residential construction may assist in achieving certain social objectives, it is unclear whether such investments contribute to longer-term productivity improvements. Moreover, while public sector investment may be important in establishing the social and economic infrastructure within which private investment can profit, such investment may not materially increase productivity growth rates.

In reviewing the 1973 and 1977 investment/GNP ratios, it appears that part of the rather high rate of investment spending in Japan is accounted for primarily by public investment and investment in residential construction. In both years, Canada's non-residential investment/GNP ratio was among the highest. In fact, the real issue is very clouded, and there is considerable doubt about the conventional proposition that the relative level of investment in Canada is too low.

On the other hand, projections that have been made of capital expenditure requirements for the next ten- or fifteen-year period suggest that the investment/GNP ratio in Canada will have to increase between 2 and 4 percentage points in order to meet demand. In effect, such studies imply that Canada has its own version of a so-called capital shortage

Table 4

Investment/GNP Ratios, Selected OECD Countries, 1960, 1973, and 1977

	1960			1973			1977		
	Total			Total			Total		
	investment/ GNP	investment/ GNP	investment/ GNP	investment/ GNP	Private non-housing investment/GNP	investment/ GNP	investment/ GNP	Private non-housing investment/GNP	investment/ GNP
Canada	22.9	22.5	19.1	23.1	13.1	23.1	19.7	13.7	19.0
Australia	28.6	23.2	19.5	23.1	14.3	23.1	19.0	14.4	19.0
France	24.0	27.7	24.3	-	16.3	-	-	-	-
Italy	24.9(a)	20.8		19.8		19.8	-	-	-
Japan	33.7	36.6	27.5	28.9	19.1	28.9	19.8	12.8	19.8
Sweden	24.7	21.6	16.1	22.0	11.0	22.0	16.5	12.2	16.5
United Kingdom	18.6	19.6	14.5	18.0	10.8	18.0	14.6	11.3	14.6
United States	18.3	-	15.5	-	10.4	-	15.0	10.1	15.0
West Germany	27.3	24.6	14.1	20.9	-	20.9	-	-	-

a 1963 value.

Source International Monetary Fund, International Financial Statistics (May 1978); Organization for Economic Co-operation and Development, Quarterly National Accounts Bulletin, (1978) III; and idem., National Accounts of OECD Countries (Paris, 1974).

that has been predicted for the U.S. economy. But Eisner has dismissed the notion that a future capital gap will emerge in the U.S. economy, as has Feldstein who points out that

"there is an important sense in which any such forecast of a 'capital gap' is misleading. It appears to predict that the demand for capital will continually exceed its supply. Usually, when there is excess demand for some good, its price rises until demand and supply are equal. In the capital market, the interest rate and the cost of equity capital should increase until they are high enough to force firms to tailor their aggregate investment demands to the available supply. There will be no 'shortfall' of investment funds because the demand for funds will shrink to the available supply."
(31)

While Feldstein resorts once more to the savings-leads-to-investment argument, we can reverse it and suggest that if there is to be strong demand for investment in Canada, these requirements will, in turn, generate the economic conditions that will bring about the flow of savings necessary to finance the investments. For the present time, however, it is not excess demand for investment that poses the problem but rather an undersupply of investment opportunities. Thus investment incentives would appear to be more appropriate than additional savings incentives for increasing Canada's capital stock. At some future time, if conditions turn around dramatically, then governments could provide additional tax incentives to increase the flow of corporate savings. Indeed, the RRSP is already a well-entrenched instrument in the financial structure that could be used as a means for stimulating further extra private sector savings.

THE THEORY OF OPTIMAL FINANCING OF PUBLIC PENSION PLANS

In its paper presented to the Commission, TEIGA argued that the choice between alternative ways of funding a national pension scheme should be made on the basis of rates of return. In some ways this is an attractive proposition for, as we have argued, the empirical work and the underlying theory provide no conclusive basis for discriminating between pay-as-you-go or full-funding arrangements. According to the TEIGA paper, such comparisons clearly favour full investment funding of the CPP/QPP plan.(32)

The crux of the debate on relative returns to savings requires a comparison of the "social rate of return" earned with full funding with the return generated by a pay-as-you-go system. The social rate of return is defined as the private rate on physical capital plus the amount of taxes normally levied on such capital; that is, the social rate of return is essentially the private rate of return plus additional private sector tax payments.(33) The rate of return to pension contributions available on the pay-as-you-go basis is roughly equal to the real growth

rate of the economy or the rate of growth of the labour force plus the improvements in labour productivity. The TEIGA paper utilized a 10 per cent figure as an approximation for the real social rate of return on capital to compare with a 5 per cent trend growth rate in real GNP. On this basis, the choice seems clear. That is, the ideal pension plan would be one that would be fully funded since it would yield a higher rate of return than a pay-as-you-go system.(34)

Thus the fairly standard conclusion, based on such comparisons, appears to favour the social rate of return argument. Pesando and Rea, for example, point out that "at an abstract level, one can demonstrate that the choice between pay-as-you-go and fully funded pension systems depends on the relationship between the social rate of return on capital and the rate of growth of earnings. Since empirical evidence suggests that the former exceeds the latter, an investment fund is desirable for Canada."(35) Moreover, if the pay-as-you-go scheme tends to depress national savings, as claimed by Feldstein and TEIGA, then by fully funding the CPP the resulting rise in the rate of savings would also lead to higher real incomes in the future. Full investment funding is consistent with a higher savings/income ratio, and the higher savings rate moves the economy to a higher per capita consumption plateau.

It is clear, then, that it is crucially important to assess properly the rates of return available under the alternative schemes. The TEIGA paper compared the 10 per cent social rate to a real annual earnings growth rate of 5.7 per cent from 1955 to 1974. Jenkins, in a paper prepared for the Economic Council of Canada, concluded that the social rate of return to capital in Canada is about 10 per cent and the real private after-tax rate of return was estimated to be 6 1/2 per cent. While one could easily quarrel with the host of refinements and adjustments for inflation he made to arrive at his real social return estimates, we will not do so here. Rather, we take exception to the sharp distinction drawn between the social and private rates of return.

For the social rate of return to, in fact, be different and at the same time greater than the private rate of return, it is necessary to assume that corporations bear the corporate tax burden; that is, the possibility that corporate income taxes and related taxes imposed upon business operations are not passed on in the form of lower wages, lower dividends, or higher prices. If corporate and other related taxes are indeed fully passed on to society, the abolition of corporate taxes would not decrease the total returns from capital. The abolition of the corporate tax would be accompanied by increased real income levels, but these would be offset by the higher personal income taxes necessary to make up the deficit in tax revenues for the various levels of government. More realistically, however, if corporate taxes were eliminated, the real private rate of return on capital would likely rise above its present after-tax level but not to the level of the presumed social rate of return, since many of the benefits of a zero corporate tax rate would be passed on to individuals. Thus we argue that it is inappropriate to

make as sharp a distinction between the social rate and private rate of return as is done by TEIGA and others.(36) Further, the important comparison is between the real rate of return on financial investments, rather than physical investment, and the rate of return on a pay-as-you-go system.

Comparisons between the rate of return on capital and the national growth rate of the economy as well as distinctions between the social rate of return and the private rate of return are, however, important when it comes to considering the optimal funding arrangements for a public pension scheme from another perspective. For example, the rate of return on a fully funded social insurance system is simply the weighted average of the returns earned from investing the funds in a host of financial securities. On the other hand, the rate of return on a pay-as-you-go system can be approximated, under certain circumstances, by the rate of growth of employment and productivity, in effect the natural growth rate of the economy. Approximating the rate of return on the pay-as-you-go system by the natural growth rate of the economy not only indexes the pension benefits to the rate of inflation, but to gains in real wage levels as well. The approximation is only valid, however, when there is either a constant age distribution for the population or when the rate of growth of employment equals the rate of growth for the pension population.

As the following relationship demonstrates, the average benefit for a pensioner (B) is equal to the average contribution rate (C) times total labour income, which in turn is a product of the number of employees (E) times the average wage and salary (W) divided by the number of pensioners (P). From this relationship, we can calculate that the annual growth in the benefits per pensioner will be equal to the sum of the annual growth rates in the contribution rate, employment, and average salaries less the growth rate in the pension population group:

$$(1) \quad B = \frac{C \times W \times E}{P}, \text{ and}$$

$$(2) \quad \% B = \% C + \% W + \% E - \% P.$$

In the calculation made by TEIGA, the rate of return on the pay-as-you-go contributions was approximated simply by the natural growth rate of the economy; the differences in the growth rates between the aggregate level of employment and the pension population were ignored. For this reason, the aging of the population was predicted to create problems for a pay-as-you-go funding arrangement. However, as can be seen from the above equations, the aging of the population would simply result in a decline in the rate of return on a pay-as-you-go system. Thus, if policy-makers decided to keep the rate of return equal to the natural growth rate of the economy, this would necessitate increasing the contribution rate.

Finally, let us consider rates of return available on financial investments. Given the rates of return on pay-as-you-go and fully funded systems, the optimal funding arrangement from the point of view of current contributors is the one that yields the highest return. At present, the funds contributed to the Canada Pension Plan have been invested primarily in non-marketable provincial government bonds. An examination of the data in Table 5 reveals that the real rate of interest earned on the securities in the past have been negative over the short periods and somewhat positive over longer periods.

In Tables 5 and 6, we set out some real rate of return estimates on bonds and equities in both Canada and the United States over the past fifty years. These types of estimates are widely used by the investment communities in both countries and are employed as reasonable pre-tax estimates for various financial investment instruments. We suggest comparing these types of rates with the long-term average growth rate of the Canadian economy as a means of selecting the optimal funding process for a public pension scheme.

Table 5
Rates of Return on Capital, Canada, 1927-76

	50 years	25 years	10 years	5 years
	(Per cent)			
Nominal returns				
Common stocks	7.71	8.12	5.44	4.98
Long-term government bonds	3.6	3.0	4.0	3.9
Consumer price index	2.47	3.31	5.96	8.29
Real returns				
Common stocks	5.24	4.81	-0.52	-3.31
Long-term government bonds	1.13	-0.31	-1.96	-4.39

Source "Report of the Committee on Economic Statistics, 1924-1976,"
October 17, 1977.

Table 6
Real Rates of Return on Capital, United States, 1927-1976

	50 years	25 years	10 years	5 years
	(Per cent)			
Common stocks	6.59	6.81	0.66	-2.29
Long-term government bonds	0.81	-1.84	-1.53	0.37
Long-term corporate bonds	1.52	0.45	-0.50	0.18
U.S. treasury bills	0.00	0.59	-0.21	-1.22

Note Actual changes are calculated using index values. Thus the ten-year change ending in 1976 uses 1966 as a base year.

Source Derived from statistics in R.A. Singufield and Robert G. Ibbotson, Stocks, Bonds, Bills, and Inflation: The Past (1926-1976) and the Future (1977-2000) (The Financial Analysts Research Foundation, 1977).

In any case, the real returns to government bonds have been below the real growth rate of the economy, although on a fifty-year basis the returns to equities have exceeded 5 per cent annually. On this simplistic basis, these figures provide a strong signal that pay-as-you-go financing is preferable to a fully funded government bond plan and a weak signal that full-investment funding in equities is preferable to the pay-as-you-go basis. The latter point requires emphasis. In order for the real rate of return to exceed the 5 per cent long-term growth rate of the economy, it would require that the fifty-year common stock average return be earned. Thus equity investment would be a must for long-term real values to materialize. In turn, heavy public investments in equities can result in other arrangements that can be less than satisfactory.

THE INSTITUTIONAL ARRANGEMENTS FOR MANAGING A FULLY FUNDED CPP

We noted in the previous section that for a fully funded CPP to be preferable to a pay-as-you-go system, investment in equities is necessary. This, in turn, raises a whole series of questions. For example, how would the fund be administered and managed? What would be the implications of a government-managed pension fund controlling large blocks of equity capital in the Canadian economy? Would investment in equities by a government pension group lead to conflicts of interest between government and certain companies or industries?

Despite the manifold management problems inherent in a system in which an enlarged CPP would invest in equities, it would in principle be possible to avoid or minimize some of the problems. As an example, instead of having one monolithic agency administering the investment of a large pool of funds, it may be preferable to hire a large number of private investment groups to administer separate small segments of the entire investment pool. Another version of this plan could perhaps involve the sale of rights to manage various blocks of the investment pool to private managers. As an example of the latter alternative, one could visualize Ottawa requesting tenders from private pension funds or investment houses, with the bidding occurring on the basis of paying a rate of return for a fixed block of money accumulated in the pension plan. The highest bids that exhausted the entire pool would be accepted. With a little ingenuity, many other possible schemes for decentralizing the investment decision could be devised.

But there still remain many other problems associated with adopting the fully funded system. The assumptions built into the plan about the real rate of return and wage growth are extremely crucial in determining the contribution rates and guaranteeing actuarial soundness. We can easily illustrate forecasting errors by pointing to the rather large deficit predicted for the CPP by about 1990. Earlier forecasts that proved too optimistic on rates of return on the investment pool as well as too low on estimated real wage increases are largely responsible for

today's actuarial concerns about the CPP. Obviously, this prospective deficit could be offset if contribution rates were increased or if benefits were reduced.

But such problems are not unique to public plans. One can also point to similar difficulties in many private sector schemes in Canada and the United States. According to a study by Ehrbar, many U.S. funds have accumulated a large quantity of unfunded liabilities as a result of earlier projections of too high real rates of return and too low real wage-growth assumptions.(37) Thus even though these private plans are assumed to be fully funded, they are, in fact, far from that.

One final point is worth making in the comparison between fully funded and pay-as-you-go systems. The notion that a growing public investment fund results in a higher national savings rate than a pay-as-you-go system holds true only during the accumulation period. That is, if the two systems were started from scratch, the contributions under a pay-as-you-go system would be just adequate to provide pension payments to existing retirement age individuals. Under a fully funded system, not only would contributions have to be made to support such individuals, but at the same time additional contributions would have to be made towards accumulating an investment fund that would generate the revenues to pay pensions to the current contributors. Consequently, the level of savings would be higher during the accumulation or early growth periods of a fully funded system.

But when both systems mature and, under similar assumptions, if the inflow of funds to the investment pool exactly equalled the outflows from the pool, the size of the investment pool would remain constant. Obviously, there would be no significant differences in the funding arrangements between full-investment funding and pay-as-you-go financing once the former fund stopped accumulating. As well, at maturity full-investment funding and pay-as-you-go financing would have similar effects on national savings.

In its accumulation stage, the investment pool would be expanding and, perhaps, under certain circumstances so would the nation's capital stock. But in light of the various comments we have made earlier, it is unlikely that the financing arrangements adopted would have any dramatic impact on the desired savings rate. However the de facto savings rate could decline if, during the accumulation phase of a public fund, the national economy weakened.

The macroeconomic effects of creating a fully funded system would depend upon the prevailing state of the economy during the accumulation phase and the rate at which funds accumulated. In order that the accumulation phase not have an adverse effect on the economy, it would be necessary for the economy to be continuously fully employed. As Lesnoy and Hambor note, "an increase in social security taxes would shift the budget in the direction of a surplus, increasing total saving in the

economy. However, increased saving will lead to a corresponding increase in capital formation only under conditions of full employment." (38) But Canada's economy is currently suffering from economic stagnation and high unemployment. The extra contributions to the fund, unless offset completely by other tax reductions, would lower aggregate demand for goods and services. Thus, at the margin, real economic growth would slow down and the unemployment rate would rise, depending upon the magnitude and speed of the accumulation phase. Lastly, investing the fund in equities would be difficult. According to Statistics Canada flow of funds data, the book value of the stock of equities in Canada in 1976 was \$68.3 billion. But the estimates of the unfunded liability of the CPP in 1977 ranged between \$81.3 and \$84.4 billion according to calculations on the status of the CPP presented by the Department of Insurance. (39) The book value of the stock of equities outstanding is in fact below the theoretical level of unfunded liabilities of the CPP.

CONCLUSION

From our survey of the empirical and theoretical issues surrounding the appropriate means for financing a public pension system, we conclude that the assertion that the modified pay-as-you-go financing technique is inappropriate does not hold up under close analysis. The evidence on the impact of pay-as-you-go public pension financing on personal saving is so ambiguous that it should be ignored. In any event, personal savings account for a fairly small proportion of national savings in Canada even though the personal savings rate is presently at an all-time high, and thus the pension versus savings question is far from crucial. The related concern that the presently underfunded CPP/QPP has caused below optimum levels of capital formation in Canada should also be ignored as a real issue. The evidence supporting this proposition begins with the unfounded assertion that national savings are suboptimal and requires the acceptance of a variety of completely unrealistic assumptions about the Canadian economy. Indeed, we commented at some length on the lack of reliability and applicability of the assumptions linking theoretical long-term growth models to the Canadian economy.

As to the point that a fully funded CPP would generate a higher real rate of return to pension contributors, we note that this depends upon what, in our view, is an inappropriate series of rate-of-return comparisons. Critics of pay-as-you-go funding point out that the correct rate of return to be used in comparison between pay-as-you-go and funded systems is not the real rate of interest that has been earned in the past, but the social rate of return on capital. We argue that there is no reason to make such a sharp distinction between the social rate and the private real rate of return to capital measures in this context, since there is a supposition here that corporations, and not the individuals in the economic system, bear the burden of corporate taxes.

Further, in order to earn a return approximating the 10 per cent estimated real social rate estimated by Jenkins for Canada, the amount accumulated in a fully funded system would have to be invested solely in equities. As the data in Table 5 indicate, the real rate of return on equity investment has been rather dismal during the past five years, but on a fifty-year basis has been in the 5 to 6 per cent range, a level slightly in excess of the natural growth rate of the economy. If the fifty-year rate of return to equities were earned in the future, then investment of funds in equities under a fully funded system would be preferable to a pay-as-you-go system yielding a rate of return somewhere in the 3 to 4 per cent range; and, if that were the case, then the implicit real rate of return to a pay-as-you-go scheme appears about as attractive as substantial long-term public investment in equities. Under pay-as-you-go, there would not be the additional concern that a large public pension fund would swallow up most of the stock of equity capital in Canada.

Finally, there remains the problem of the extra large dose of economic deflation Canada would experience if full-investment funding were adopted when the economy already has a high volume of underutilized labour and capital. Indeed, though the plan might increase the volume of national savings by building up a large investment pool of funds, the effect could be quite the reverse, as the paradox of thrift would likely come into play.

- (1) "Statutory Actuarial Report No. 6 as of December 31, 1977." The Department of Insurance estimates that, with a continuous 3.6 per cent contribution rate, Canada's CPP fund would, on the basis of accompanying projections of benefits and expenses for the CPP (Fund A), become exhausted in the year 2003. For the fund to become a pure pay-as-you-go financed scheme, the contribution rate would have to rise between 1995 and 2050 to maintain a constant \$34.7 billion fund (Fund C). The Royal Commission's own studies have CPP Fund C becoming a pure pay-as-you-go system after 1991, when that fund stabilizes at \$36.1 billion.
- (2) Martin Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," Journal of Political Economy, 82 (1974), pp. 905-926; idem., "Perceived Wealth in Bonds and Social Security: A Comment," Journal of Political Economy, 84 (1976), pp. 331-336; idem., "Does the United States Save Too Little?" American Economic Review: Papers and Proceedings, 67 (1977), pp. 116-121; and Alicia H. Munnell, "Private Pensions and Saving: New Evidence," Journal of Political Economy, 84 (1976), pp. 1013-1032.
- (3) Ontario Ministry of Treasury, Economics and Intergovernmental Affairs (TEIGA), The Economics of Financing National Pension Plans (Toronto, 1977); see also their Review of Issues in Financing the Canada Pension Plan (Toronto: Queen's Printer, 1976).
- (4) Since 1966, CPP benefits have been financed out of contributions paid by both employers and employees. The contribution rate is currently 1.8 per cent of annual earnings for both contributors, subject to a basic exemption and a ceiling on earnings subject to pensionable earnings. The year's maximum pensionable earnings (YMPE) figure is \$11,700 in 1979.
- (5) See William H. Branson, Macroeconomic Theory and Policy (New York: Harper and Row, 1972), especially chapters 18 and 19.
- (6) Edmund S. Phelps, "The Golden Rule of Accumulation: A Fable for Growth Men," American Economic Review, 51 (1961), pp. 638-643; and his "Second Essay on the Golden Rule of Accumulation," American Economic Review, 55 (1965), pp. 793-814.
- (7) Paul A. Samuelson, "A Catenary Turnpike Theorem," American Economic Review, 55 (1965), pp. 486-496; and "A Turnpike Refutation of the Golden Rule," in K. Shell, ed., Essays on the Theory of Optimal Economic Growth (Cambridge, Mass.: MIT Press, 1967).
- (8) Joan Robinson, Economic Heresies (New York: Basic Books, 1971).
- (9) Stephen A. Marglin, "What Do Bosses Do? Part II," Review of Radical Political Economics, 7 (1975), pp. 20-37.
- (10) Edward F. Denison, The Sources of Economic Growth and the Alternatives Before Us (New York: Committee for Economic

- Development, 1962); and Thomas Wilson and Harvey Lithwick, The Sources of Economic Growth, Royal Commission on Taxation Study 24 (Ottawa: Queen's Printer, 1968).
- (11) See J.M. Keynes, The General Theory of Employment, Interest and Money (New York: Macmillan, 1957).
 - (12) Feldstein, "Does the United States Save Too Little?"
 - (13) Ibid. See also Glenn P. Jenkins, Capital in Canada: Its Social and Private Performance, 1965-74, Economic Council of Canada Discussion Paper 98 (Ottawa, 1976). The rate of return as measured by Feldstein and by Jenkins is an average rate of return and not the marginal rate of return on capital. TEIGA used the Jenkins' rate of return figures to support their proposal for full investment funding of the CPP; see Review of Issues.
 - (14) Irving Fisher, The Theory of Interest (New York: Macmillan, 1930); Albert Ando and France Modigliani, "The 'Life-Cycle' Hypothesis of Saving: Aggregate Implications and Tests," American Economic Review, 53 (1963), pp. 55-84.
 - (15) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," p. 908.
 - (16) Marglin, "What Do Bosses Do?" p. 21.
 - (17) James Duesenberry, Income, Saving, and the Theory of Consumer Behaviour (Cambridge, Mass.: Harvard University Press, 1967).
 - (18) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation"; Munnell, "Private Pensions and Saving."
 - (19) Marglin, "What Do Bosses Do?" p. 20.
 - (20) Ibid., p. 21.
 - (21) Phillip Cagan, The Effect of Pension Plans on Aggregate Savings: Evidence from a Sample Survey, National Bureau of Economic Research, Occasional Paper 95 (New York: Columbia University Press, 1965). It is possible that Cagan's sample was not representative of the general population in that Consumer Reports subscribers might have been more inclined to know about tax advantages for savings and hence saved more.
 - (22) George Katona, Private Pensions and Individual Savings, Survey Research Center, Institute for Social Research (Ann Arbor: University of Michigan Press, 1965).
 - (23) Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation."
 - (24) Munnell, "Private Pensions and Saving," p. 1030.
 - (25) Robert J. Barro, "Are Government Bonds Net Wealth?" Journal of Political Economy, 82 (1974), pp. 1095-1117.
 - (26) J. Ilkiw, Public Pensions and Personal Saving: Canadian Evidence in the Extended Life Cycle Model (Toronto: TEIGA, 1977).

- (27) James Pesando and Samuel Rea, Jr., Public and Private Pensions in Canada: An Economic Analysis, Ontario Economic Council (Toronto: University of Toronto Press, 1977).
- (28) Feldstein's time-series results would have been more reasonable and more in line with the implications of the life-cycle hypothesis if, instead of inserting wealth variables in a simple linear form, he had related the actual stock of wealth accumulated at a given point in time to the desired stock of wealth. In other words, as income levels and expectations increase over time, so too would the desired stock of wealth, and consequently each additional dollar increment to wealth need not have the same impact on aggregate consumption and savings as the previous dollar increment. In effect, under some circumstances, the marginal propensity to consume out of wealth would be a declining function of the stock of wealth.
- (29) William R. Waters, "Pension and Savings Patterns," Canadian Perspective (September/October, 1977).
- (30) Selig Lesnoy and John Hambor, "Social Security, Saving, and Capital Formation," U.S. Social Security Bulletin, July 1975.
- (31) Robert Eisner (1977), "Capital Shortage: Myth and Reality," American Economic Review: Papers and Proceedings, 67, (1967), pp. 1110-1115; Feldstein, "Does the United States Save Too Little?" p. 119.
- (32) TEIGA, The Economics of Financing National Pension Plans.
- (33) This definition should be distinguished from the return to financial capital.
- (34) Aaron has commented on the so-called social insurance paradox. That is, with a constant contribution rate under unfunded pay-as-you-go systems, the rate of return would be the growth rate of real wage payments (or real output). If that growth rate is in excess of the social rate of return, then the individual should prefer public pay-as-you-go financing to fully funded social security financing or private investment; Henry Aaron, "The Social Insurance Paradox," Canadian Journal of Economics and Political Science, (1966), pp. 371-374.
- (35) Pesando and Rea, Public and Private Pensions in Canada, p. 130.
- (36) The apparent discrepancy was 4.3 percentage points. Yet if our argument about the incidence of the corporate tax holds, then the differential, without a corporate tax, would likely be reduced because of a higher potential private return.
- (37) A. Ehrbar, "Those Pension Funds Are Even Weaker than You Think," Fortune, 96 (1977), pp. 104-114.
- (38) Lesnoy and Hambor, "Social Security, Saving, and Capital Formation," p. 14.

- (39) Department of Insurance, "Statutory Actuarial Report No. 6, as of December 31, 1977" (Ottawa, 1978).

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Methodology and Assumptions Adopted For Canada Pension Plan Financial Projections Undertaken by the Royal Commission on the Status of Pensions in Ontario

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Methodology and Assumptions Adopted for Canada Pension Plan Financial Projections Undertaken by the Royal Commission on the Status of Pensions in Ontario

This statement summarizes the methodology and assumptions adopted for Canada Pension Plan financial projections undertaken by the Commission. Included is documentation of the various projections undertaken, including funding alternatives beyond those customarily examined by the Federal Department of Insurance.

POPULATION PROJECTIONS

The population projections for the December 31, 1977 CPP financial projections were developed by forecasting changes in the 1971 census data. This was achieved by applying mortality factors (based on age and sex) to the 1971 census population to determine the number of deaths occurring each year and thereafter to the resultant surviving population through the year 2050.

Added to the projected population derived from the 1971 census data were new-born children (based on specified fertility rate assumptions) and immigrants to Canada. The latter were reduced by emigrants from Canada. Each of the immigrant/emigrant populations has separate age and sex characteristics.

Because the CPP excludes Quebec, separate population projections are required for Quebec to derive the net population (Canada less Quebec) needed for the CPP financial projections. Inherent in this analysis was the need to determine the percentage of immigrants that come to Quebec and the percentage of emigrants that depart, and of those who migrate from Quebec to the rest of Canada (or vice versa), along with assumptions for their age and sex composition.

Financial projections desired for the Ontario population required the development of projections for Ontario in a manner consistent with the way in which Quebec populations were developed.

Mortality

The Life Table 1970-72, Canada, published by Statistics Canada, was assumed applicable to 1971. Mortality thereafter was assumed to improve to an ultimate mortality table applicable to the year 2050. Intermediate years were obtained by geometric interpolation. These rates were assumed to apply to Canada and Quebec. Corresponding Quebec mortality rates were used in developing the required Quebec population used to arrive at the Canada less Quebec population. Life expectancies for Canada and Ontario produced from these mortality rates are as follows:

	1971		2050	
	Males	Females	Males	Females
At birth	69.3	76.4	73.1	81.2
From age 65	13.7	17.5	16.0	20.7

Census data for 1971 were used for projection purposes rather than the 1976 census data due to the fact the latter were not available early enough to use as a base for projection purposes.

Comments

The mortality rates adopted were identical to those developed by the Department of Insurance for the December 31, 1977 CPP population projections.(1) Mortality rates applicable to the year 2050 were based on a study by the U.S. Social Security Administration (Actuarial Study No. 77). This study developed rates of mortality for the year 2050 by considering death rates by age groups and sex for 10 broad cause of death groupings. The assumed percentage reductions for each cause of death were combined to produce an average reduction in mortality by age and sex for all 10 causes of death. Since the base year for projections for the CPP was 1971, it was necessary to compare the rate of improvement in U.S. mortality rates from 1971 to 2050 and to apply such improvement to Canadian mortality rates applicable in 1971.

Projections for future mortality improvement embodied in the U.S. Actuarial Study No. 77 provided for more modest mortality improvements than used in prior mortality projections of the CPP by the Department of Insurance.

This change is consistent with the general levelling-off of death rates at most ages in the 1960s but is not consistent with the trend started in 1976 where mortality rates started to come down again as the result of such factors as:

- A cut-back in the number of people smoking;
- A reduction in highway speed limits; and
- The requirement in some provinces for the wearing of seatbelts.

Whereas the last two items reduce the number of accidental deaths - the largest cause of death for those under age 35 where mortality is already very low - the reduction in smoking probably has a more marked impact on the mortality rates of older members of the population.

While there has been a marked mortality improvement at the younger and middle ages, there has been a less marked change at the older ages. Thus, although it is reasonable to assume that the present rate of improvement in longevity will continue as the result of advances in

medicine and public health, an eventual slow-down in longevity improvement will undoubtedly occur at some point 20 to 25 years from now.

For these reasons, we believe the mortality projections developed by the Department of Insurance are appropriate for the CPP population projections.

Projections by the U.S. Social Security administration also assume that the gap between male and female mortality will continue to grow, on the theory that females will not react to stress the way males have done. We concur with this viewpoint.

The Commission considered the possible impact of a sudden improvement in mortality as the result of a significant medical breakthrough. In fact, the mortality improvements developed by the U.S. Social Security Administration anticipated medical breakthroughs on a modest scale. This alternative was not explored since it was recognized that any such result would probably bring about a corresponding change of major proportions in the CPP design, such as an increase in the age at which government pensions first commence.

Mortality rates for Ontario and Canada residents were assumed to be identical, since an examination of current rates of survival to age 65 and life expectancies after age 65 indicated little difference for the two populations. Separate rates for Quebec were used due to the fact mortality rates historically have been higher in that province.

Fertility

The net reproduction rates used for four fertility scenarios developed by the Commission with its sociologist, Daniel Kubat, are summarized below:

		Net reproduction rates (NRR)			
		Low/Low	Low	Most probable	High
1971)		actual:			
to) --		----- Canada for Canada projections-----			
1974)		Ontario for Ontario projections			
		Quebec for Quebec projections			
1975)					
to) --		----- By linear interpolation-----			
1985)					
1985	.90	1.00	1.20	1.45	
1990	.90	1.00	1.10	1.30	
1995	.90	1.00	1.00	1.15	
2000+	.90	1.00	1.00	1.00	

Note: Intervening rates for years 1985 to 2000 obtained by interpolation.

The net reproduction rates for 1971 to 1974 for Canada, Quebec, and Ontario were based on actual rates obtained from Statistics Canada. Rates for 1975 through 1984 were interpolated linearly from the 1974 and 1985 values. Rates for 1985 and later years were assumed to apply to Canada, Quebec, and Ontario. Note that a net reproduction rate of 1.00 means that every female born alive will bear one female child. In all cases, the distribution of the age-specific fertility rates used was that of the three-year average for 1970-72 by geographical region, with the total of such rates adjusted to produce the assumed total fertility rate in each calendar year.(2)

In this connection it should be noted that a net reproduction rate of 1.00 equates to approximately a total fertility rate of 2.112, i.e., 2.112 is the average number of live births to females.

Comments

In developing his projections for fertility rates, Kubat noted that fertility had been decreasing and, starting in 1972, had reached values below unity as depicted in the table below:

	Gross reproduction rates		
	Canada	Quebec	Ontario
1931	1.555	1.940	1.285
1941	1.307	1.645	1.164
1951	1.701	1.834	1.560
1956	1.874	1.892	1.780
1961	1.868	1.787	1.824
1966	1.369	1.284	1.361
1971	1.060	.908	1.078
1972	.982	.836	.993
1973	.937	.812	.952
1974	.891	.806	.915

Source Vital Statistics, Vol. 1, 1974,
Cat. 84-204.

In developing his most probable scenario for fertility rates, Kubat postulated that the net reproduction rate would not only return to unity by 1985, but would probably reach a level of 1.20 due to what he referred to as the baby boom echo. He noted that women born during the baby boom have begun to show a trend toward higher fertility rates. This has been evidenced by a higher age-specific fertility (number of children born per 1,000 women annually) for women in 1970. This has commenced notwithstanding the fact that overall fertility rates are still declining. In his view, these statistics evidence a partial postponement of child-bearing rather than a total cessation. He suggested that this trend would probably continue through 1990 and lead to a net reproduction of 1.00 in the year 2000.

Kubat's rationale for an eventual net reproduction of 1.00 in all four fertility scenarios (which is equivalent to zero population growth eventually, i.e., by the time persons born today start to die) is based on the following comments that he made to the Commission:

"Actuarially, assuming perfect replacement (one daughter per female over the life span of the female), is a feasible assumption for any population projection dealing with long term spans; any growth, positive or negative, is exponential and difficult to imagine. On the other hand, the history of population does not offer any evidence of a sustained zero growth. The close to zero growth for thousands of years in the past was due primarily to dramatic fluctuations in mortality which wiped out substantial populations at different time intervals. Sociologically, one has to expect fluctuations in fertility behavior around a net replacement ratio of 1, fluctuations which are more likely to stay above unity than below unity. In other words, if most women have children, the probability that they will have more than two children is fairly great. Current fertility, which is at a net replacement ratio of 1, or slightly below 1, is a statistical artifact of the number of women who have no children and women who have more than two, the resulting social differences in disposable income resulting from this distribution are bound to increase the proportion of women without children. On the other hand, 'a climate of optimism' or a return to more traditional values may bring a turnabout in fertility, attracting the previously childless women into child-bearing and increasing thus the overall fertility to levels substantially above unity for net replacement ratios."

In his high fertility scenario Kubat assumed that there could be a potential snowballing effect of a rise in fertility by the very large cohorts of children reaching child-bearing age in the next several years. He anticipates an increase in net reproduction rates to 1.45 in 1985, declining to 1.00 by the year 2000.

In his low fertility scenario he assumed a return to a net reproduction rate of 1.00 by 1985 and no change thereafter.

For these reasons we subscribe to his theory that ultimately a net reproduction rate of one is the only meaningful fertility assumption, barring unforeseen circumstances such as a major war or epidemic.

A low/low scenario has also been introduced by the Commission to measure the financial effect on the CPP if fertility rates continued indefinitely at current levels, that is, at a net reproduction rate of .90.

Immigration, Emigration and Migration

Table 1 outlines the assumptions used for immigration, emigration, and migration for the three geographical regions - Canada, Quebec, and Ontario. Immigration figures for years 1971 to 1977 are actual results, whereas the emigration figures are estimates made by Kubat. For 1978, immigration to Canada was taken at 100,000 with Quebec assumed to receive 15 per cent and Ontario 50 per cent. Emigration from Canada for 1978 was taken as 40,000 with Quebec assumed to lose 25 per cent of this number and Ontario 40 per cent. For calendar years after 1978, the 100,000 and 40,000 figures were increased 1/2 of 1 per cent per year through the year 2000 when these absolute amounts were frozen. Thus, net Canadian immigration was set at 60,000 in 1978 and 66,960 in 2000 and later.

Migration from Quebec to Canada was taken at 22,017 in 1971 (the actual number) and graded linearly to an assumed level of 20,000 in 1978 and 5,000 in 2000 and later. Zero net migration was assumed from Ontario to the rest of Canada. The assumptions assume net outflows from Quebec to the rest of Canada as follows:

	<u>Immigration</u>	<u>Emigration</u>	<u>Migration</u>	<u>Net Outflow</u>
1971	19,222	16,500	22,017	19,295
1978	15,000	10,000	20,000	15,000
2000 and later	16,740	11,160	5,000	-580

Distribution of immigrants by age and sex were obtained from "Analytical and Technical Memorandum No. 6: Migration Projections for Canada", by K.S. Gnanasekaran (Statistics Canada). Since statistics on emigrants are not maintained, the distribution of emigrants by age and sex was based on the distribution of emigrants to the United States from Canada obtained on a continuous basis by Statistics Canada from the U.S. Department of Justice. It is noted that emigrants from Canada to the United States have comprised approximately two-thirds of immigration to the United States in recent years. Immigrants over age 65 were ignored in order to avoid a substantial overstatement of benefits in respect of immigrants. These distributions are shown in Table 2.

Comments: Immigration and Emigration

In his submission to the Commission, Kubat indicated that the assumption by the Department of Insurance for its CPP valuation (December 31, 1977) of 160,000 immigrants and 60,000 emigrants would lead to a net immigration assumption (100,000) that is too high. His view was that "net" immigration should be closer to 60,000 rather than 100,000 starting in the calendar year 1978. Kubat recommended that we assume annual immigration of 100,000 and emigration of 40,000, both of these figures to increase by 1/2 of 1 per cent per year from 1978 to the year 2000 (to net about 67,000) and remain constant thereafter. The

Department of Insurance's "net" immigration figure applied to 1971. It increased thereafter in such a way that it would remain constant as a percentage (.465 per cent) of the total population.

Kubat explained that until about 1990 we could expect to see a continuation of the influx of "dependent" versus "independent" immigrants to Canada. The age and sex distributions of immigrants being used by the Department of Insurance (developed by Gnanasekaran) are based on averages developed over the period 1959-68. As can be seen from Table 3, the proportion of independents that emigrated to Canada in the period 1959-68 and ended up as workers, hovered around 60 per cent. But starting with 1975, the percentage of independents who ended up as workers fell markedly to a low of 50 per cent in 1977. This analysis suggests that there may have been a change in the average age/sex composition of immigrants to Canada starting with 1975. An examination of Table 4 shows that there has been a change, with a heavier number of dependents coming to Canada in 1976 versus the period 1959-68. Overall, however, there has not been a significant change.

The revised immigration policy that took effect in early 1978 permits the Canadian government to establish numerical targets for immigration each year. Although this legislation retains its non-discriminatory features, it has dropped the "nominated" relative category. (It is also interesting to note that the first immigration target level for 1979 was set at 100,000). This will undoubtedly lead to a return to a higher proportion of independents emigrating to Canada sometime in the 1980s and a return to the 1959-68 immigration experience. Accordingly, Kubat has recommended that the age and sex distributions being adopted by the Department of Insurance be used for projections required by the Commission. In his view, the use of two tables covering the age and sex composition of immigrants, one to say 1990 and another one thereafter, hardly seems practical when one considers how little it will affect the overall financial projections.

Comments: Migration

In his submission, Kubat suggested that 15 per cent of all immigration to Canada will be to Quebec with 25 per cent of all emigration from Canada being from Quebec. In its December 31, 1977 population projections, the Department of Insurance used 17.33 per cent for 1971, grading to 25 per cent in 2000 for immigration, and 29.84 per cent for 1971 grading to 25 per cent in 2000 for emigration. Actual immigration figures for 1971 to 1977 were used in the projections made for the Commission, rather than using the interpolative approach adopted by the Department of Insurance.

Starting in 1978, immigration to Quebec was assumed to occur at a level equal to 15 per cent of all immigration to Canada in contrast to the 25 per cent figure adopted by the Department of Insurance. The

following information produced by Kubat supports the use of a 15 per cent assumption:

	<u>Per cent of all foreign-born residing in Quebec</u>	<u>Per cent of all population residing in Quebec</u>
	(Per cent)	
1931	10.9	27.7
1941	11.1	28.9
1951	11.1	28.8
1961	13.7	28.8
1971	14.2	27.9

In 1975 and 1976, the proportion of immigrants declaring Quebec as their intended province of residence was 14.9 per cent and 19.6 per cent respectively. According to Kubat,

"The current drive by Quebec to recruit immigrants from abroad may yield some immigrants who will state their intent to come to Quebec and settle there. However, more likely than not, a proportion of such immigrants, unless they are fully francophone, will find their way to Ontario or other provinces."

For the foregoing reasons he views the 15 per cent assumption as a realistic one.

Net migration to Ontario historically has been positive but recently has become slightly negative. Kubat's view is that net migration for Ontario will most likely fluctuate around a zero value.

Correlation of Immigration, Emigration and Migration Projections with Fertility Assumptions

In discussions, Kubat commented that the immigration, emigration and migration projections should parallel or mirror the fertility assumptions used for the various scenarios. This process can be rationalized by recognizing that, under the new immigration policy, the federal government will be establishing quotas which will reflect the number of youth becoming available for jobs in the market place. Consequently, higher fertility rates under one scenario will, approximately 20 years later, lead to a possible reduction in the number of immigrants allowed to enter Canada.

Although this correlation is desirable, it was decided that this kind of "fine tuning" was not that important in the projection process, particularly when it is realized that its first impact is at least 20 years into the future. Consequently, it was decided that the immigration, emigration and migration assumptions should apply to all four fertility scenarios.

Table 1
Immigration, Emigration and Migration Assumptions

Immigration	Canada	Quebec	Ontario
1971	121,900	19,222	64,357
1972	122,006	18,592	63,805
1973	184,200	26,871	103,187
1974	218,465	33,458	120,115
1975	187,881	28,042	98,471
1976	140,429	29,282	72,031
1977	114,914	19,248	56,594
1978 and later	100,000 (a)	15 per cent of Canada	50 per cent of Canada
Emigration			
1971	55,000	30 per cent of Canada	42 per cent of Canada
1972	48,000	30 per cent of Canada	42 per cent of Canada
1973	44,000	30 per cent of Canada	41 per cent of Canada
1974	40,000	28 per cent of Canada	40 per cent of Canada
1975	38,000	23 per cent of Canada	44 per cent of Canada
1976	40,000	21 per cent of Canada	45 per cent of Canada
1977	40,000	25 per cent of Canada	40 per cent of Canada
1978 and later	40,000 (a)	25 per cent of Canada	40 per cent of Canada
Migration	Quebec to Canada (b)	Ontario to Canada	
1971	22,017	Ø	
1978	20,000	Ø	
2000 and later	5,000	Ø	

a Increases by 1/2 of 1 per cent per year through the year 2000.

b Graded linearly from 1971 to 1978 and from 1978 to 2000.

Source The Royal Commission on the Status of Pensions in Ontario, prepared from material supplied by Daniel Kubat.

Table 2
Distribution of Immigrants and Emigrants by Age Group

Age group	Immigrants		Emigrants	
	Males	Females	Males	Females
	(Per cent)			
0-4	4.879	4.607	6.365	5.985
5-9	4.176	3.903	5.053	5.069
10-14	2.948	2.808	3.532	3.447
15-19	3.758	4.096	2.689	3.596
20-24	8.969	10.470	3.601	8.881
25-29	9.147	8.049	6.436	7.240
30-34	5.728	4.838	6.097	5.105
35-39	3.699	3.123	4.861	3.826
40-44	2.189	1.931	3.199	2.755
45-49	1.316	1.371	2.143	1.846
50-54	.927	1.226	1.397	1.480
55-59	.694	1.157	.939	1.072
60-64	.530	1.012	.539	.721
65-69	.471	.755	.429	.532
70 plus	.427	.796	.499	.675
All ages	49.858	50.142	47.779	52.221

Source The Royal Commission on the Status of Pensions in Ontario, prepared from material supplied by Daniel Kubat.

Table 3
Immigrants to Canada, by Proportion Destined for Labour Force, by Class of Admission, 1968-1977

	All immigrants		Distribution and proportion workers per class of admission					
	Workers		Sponsored(a)			Nominated(a)		
	(Number)	(Per cent)	(Thousands)	(Per cent)	(Thousands)	(Thousands)	(Per cent)	Independent(a) (Thousands) (Per cent)
1968	183,974	52	38.3	17	35.0	110.6	54	64
1969	163,531	52	33.5	20	39.1	88.9	56	63
1970	147,713	53	32.2	20	35.1	80.3	56	64
1971	121,900	50	33.5	22	29.3	59.1	57	63
1972	122,006	49	33.1	23	30.9	58.0	57	59
1973	184,200	50	42.0	21	53.2	97.5	54	61
1974	218,465	50	54.3	20	44.7	110.9	53	61
1975	187,881	43	64.3	21	47.0	76.6	52	55
1976	149,429	41	61.8	27	38.6	49.0	52	51
1977	114,914	41	52.3	30	28.7	33.8	54	50

a Sponsored (close relatives); Nominated (relatives not in the sponsored category) independent (other immigrants)

Source Manpower and Immigration. Canadian Immigration and Population Study; Immigration and Population Statistics. (Ottawa, 1974). Employment and Immigration Canada, unpublished data.

Table 4

Comparison of 1976 Age/Sex Composition of Immigrants to Canada with
Averages for Years 1959-1968

Age Group	Males			Females		
	1959- 1968-	1976	Difference	1959- 1968	1976	Difference
	(Per cent)					
0-4	10	9	-1	9	7	-2
5-9	8	10	+2	8	9	+1
10-14	6	8	+2	6	8	+2
15-19	8	9	+1	8	8	-
20-24	18	13	-5	21	17	-4
25-29	18	13	-5	16	16	-
30-34	12	10	-2	10	9	-1
35-39	7	7	-	6	5	-1
40-44	4	4	-	4	3	-1
45-49	3	3	-	3	3	-
50-54	2	2	-	2	3	+1
55-59	1	2	+1	2	3	+1
60-64	1	3	+2	2	4	+2
65-69	1	2	+1	2	3	+1
70+	1	2	+1	2	3	+1
Total	100	100	-	100	100	-

Source The Royal Commission on the Status of Pensions in Ontario,
prepared from material supplied by Daniel Kubat.

ECONOMIC ASSUMPTIONS

Projections of real wages and salaries, real investment return and inflation were developed by the Commission's economist, Arthur Donner. His assumptions are explained below, followed by a discussion of their application in arriving at a complete economic basis for the Commission's projections.

Basis of Economic Assumptions (Arthur Donner)

Actuarial calculations for the CPP, or for any pension plan, require a series of economic assumptions for the forecast period. The critical economic variables in such projections are the rates of change in wages (specifically the industrial composite wage index), rates of change in prices (the CPI), and nominal interest rates (yields on provincial or federal government long-term securities). While the projected levels of future wages, prices, and interest rates are important, their relative importance is also evident in their so-called "real counterpart" measures (real wages and real interest rates). Over the longer term the nominal values for any economic variables are inter-related as high rates of inflation tend to be associated with higher nominal interest rates, and, in turn, faster inflation translates into more rapid rates of increase in money wages.(3)

Three inflation scenarios are set out in Table 5; a most probable inflation scenario which has the average rate of inflation only minimally decelerating between 1978 and 1984, a high probable inflation scenario which has inflation remaining at a very high rate by historical standards until 1984, and a low probable inflation scenario which has inflation moderating at a 4-1/2 per cent average rate between 1980 and 1984, and a 4 per cent average rate between 1985 and 1989. In all three cases, a constant rate of inflation is assumed beyond 1990.

The rationale for the central or most probable inflation projection is partly based on the view that inflation, over the longer run, is a purely monetary phenomenon determined primarily by the long-term growth rate of the money supply less the long-term growth rate of full capacity national production. One must be aware that in the shorter time horizon, price adjustments to particular factors such as energy costs, food costs, and a depreciated currency can worsen recorded inflation rates. The shorter-run shocks are assumed to fully work themselves out by the early 1980s.

As well, governments (whether national or provincial) and the Bank of Canada have introduced a series of policy measures which, if extended into the 1980s, are consistent with lower average rates of inflation in the 1980s than in the late 1970s. Thus the most probable inflation scenario has prices moderating from their near two-digit level increases in the late 1970s down to a 5.5 per cent average annual rate of increase

between 1980 and 1984, a 5 per cent average annual rate of increase 1985-1989, and a 4 per cent average annual rate of increase thereafter.

The three inflation scenarios differ from each other in a related way. The high-inflation case has prices and wages increasing at a two percentage point faster than the comparable figures for the most probable case. The low-inflation scenario records prices and wages rising at a 1 per cent lower rate than the most probable projection. Nominal interest rates in the high and low-inflation scenarios were similarly projected relative to the most probable case. That is, in the high scenario, future nominal interest rates are 200 basis points in excess of the most probable case, and 300 basis points in excess of the low-inflation case.

After 1990, it was assumed that real wages and real long-term interest rates would trend at a constant rate in all scenarios, consistent with the wage and price inflation forecast. But prior to 1985 some allowance was made in these projections for the poorer real rates of return to bonds in the high-inflation case, and the improved real rates of return to bonds in the low-inflation case.

The constant real interest rate and real wage rate projections beyond 1990 are based on historical long-term trends. If the distribution of income is to remain relatively constant in the future, then real wages must trend at a rate of growth similar to that of real output per worker. Thus, the historical long-term gain in real wages of 2.1 per cent per annum after 1990 which was adopted in these projections is consistent with a 50-year average experience, as well as with a historical average rate of growth for real output per worker. In a similar way, the three series of projections generate a 2.4 per cent per annum real interest rate return after 1990, since this has tended to be the long-term real rate of return to these particular provincial securities.

Application of Economic Assumptions

The long-term assumption of 2.1 per cent real growth in wages and salaries was based on a 50-year analysis of the Statistics Canada Average Weekly Wages and Salaries Industrial Composite Index. Table 6 demonstrates that a trend line of 2.1 per cent provides a very close fit to the 50-year experience of real growth in wages and salaries.

The CPP fund is invested using interest rates that reflect those on long-term Government of Canada bonds (terms of 20 years and longer). The long-term trend line for real rates of return on long-term Canada bonds (10 years term and over) is 2.25 per cent (see Table 7). This was estimated to be 2.40 per cent if 20-year and over Canada bonds were used. For Ontario, it was recommended by Donner that real rates of investment return be set .4 of 1 per cent higher than for Canada on the assumption that if Ontario set up its own pension plan, the interest

rate would be geared to Ontario long-term bonds, rather than Canada long-term bonds.

Inflation has been assumed ultimately (1990) to reach 4.0 per cent under the most probable forecast, with an ultimate level of 3.0 per cent on the low level and 6.0 per cent on the high economic forecasts. The ultimate (1990 and later) forecasts are summarized below:

<u>Annual rates of return</u>	<u>1990 and later forecasts</u>		
	<u>Low</u>	<u>Most</u>	
		<u>probable</u> (Per cent)	<u>High</u>
1. Investment return	5.4	6.4	8.4
2. Growth in wages and salaries	5.1	6.1	8.1
3. Inflation	3.0	4.0	6.0
4. Real rates of investment return = (1) - (3)	2.4	2.4	2.4
5. Real growth in wages and salaries = (2) - (3)	2.1	2.1	2.1

Two alternative projections were made relating closely to the most probable economic scenario. These additional projections adjusted the real growth in wages and salaries up to 1/2 of 1 per cent and down 1/2 of 1 per cent for calendar years 1979 and later, while keeping the inflation rates the same. This had the effect of maintaining the real investment rates of return at 2.4 per cent but changing the ultimate (1990 and later) growth in real wages and salaries - in the one case from 2.1 per cent to 1.6 per cent and in the second case to 2.6 per cent. The total growth rates for salaries and wages were thus 5.6 per cent and 6.6 per cent respectively rather than 6.1 per cent.

Comments

The Department of Insurance CPP financial projections embodied a real investment return of 3.0 per cent in 1973 and later, as contrasted to the 2.4 per cent figure used by the Commission. Based on the historical trend line depicted in Table 7, it is difficult to justify a 3 per cent real rate of return. However, it should be recognized that this assumption only has a bearing on the relative size of the CPP fund, and in the instance where only a modest fund is developed, this factor has little impact on the financial projections. The real growth in wages and salaries on the other hand, is a critical variable since it affects the growth in the YMPE which in turn affects both benefit levels and contributions. Here the assumption of 2.1 per cent (based on the trend line obtained from Table 6) used for the Commission's projections is very close to the 2.0 per cent figure adopted by the Department of Insurance.

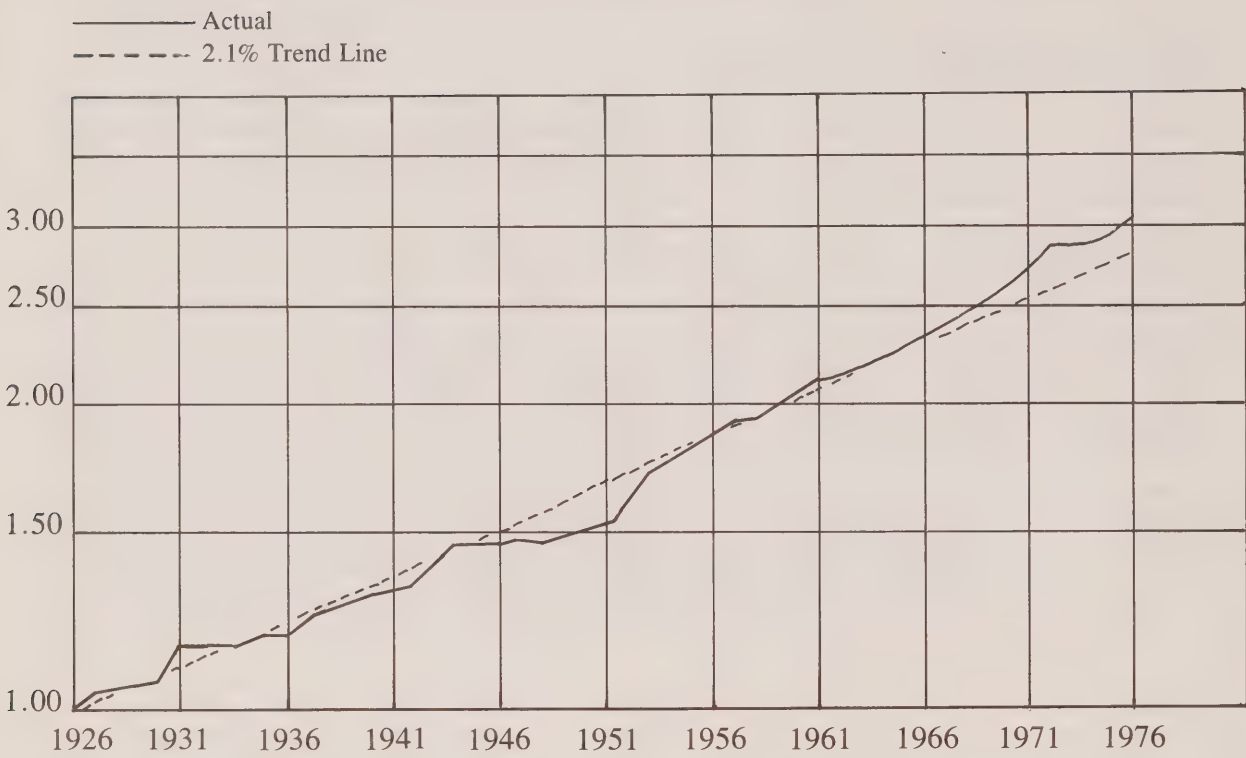
Table 5
Economic Assumptions

		Wages and salaries		Interest rates(a)	
	Inflation	Real growth	Total growth	Real return	Total return
		(Per cent)			
Most probable economic scenario					
1978	7.3	-.3	7.0	1.7	9.0
1979	6.0	2.0	8.0	2.3	8.3
1980-84	5.5	1.8	7.3	2.4	7.9
1985-89	5.0	2.0	7.0	2.6	7.6
1990 and later	4.0	2.1	6.1	2.4	6.4
High probable economic scenario					
1978	9.3	-.3	9.0	1.2	10.5
1979	8.0	2.0	10.0	1.8	9.8
1980-84	7.5	1.8	9.3	2.4	9.9
1985-89	7.0	2.0	9.0	2.6	9.6
1990 and later	6.0	2.1	8.1	2.4	8.4
Low probable economic scenario					
1978	6.3	-.3	6.0	1.8	8.1
1979	5.0	2.0	7.0	2.5	7.5
1980-84	4.5	1.8	6.3	2.5	7.0
1985-89	4.0	2.0	6.0	2.7	6.7
1990 and later	2.0	2.1	5.1	2.4	5.4

a Based on long-term government bond index (10 years and over) increased by .3 of 1 per cent to adjust to Government of Canada bonds with terms of 20 or more years.

Table 6

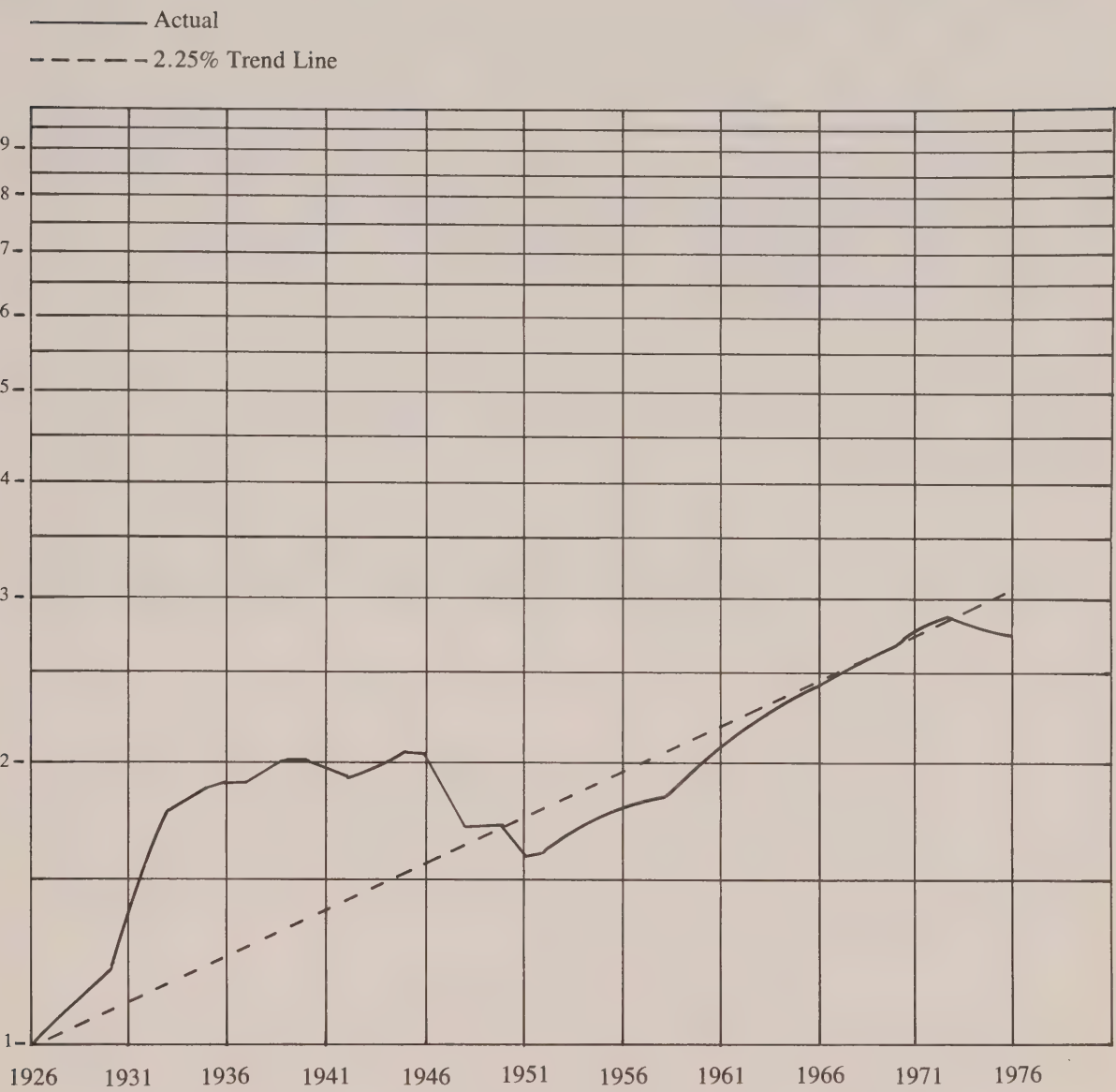
INDEX FOR REAL WAGES IN CANADA



Source Statistics Canada, *Average Weekly Wages & Salaries, Industrial Composite Index*.

Table 7

REAL RATES OF RETURN ON
LONG-TERM GOVERNMENT OF CANADA BONDS



Source Bank of Canada Review
(Bonds have terms of 10 years and longer)

OTHER ASSUMPTIONS

Here we will describe the other assumptions used in performing the CPP financial projections requested by the Commission.

Participation Rates

Participation rates for 1971 to 1975, assuming a zero Year's Basic Exemption (YBE), were developed from data obtained from the CPP Division of the Department of Supply and Services, by dividing the total number of contributors by the projected population in each calendar year age-group sex cell (11 groups for each sex). These were developed for Canada (less Quebec) and Ontario. Participation rates for 1966 to 1970 were developed from similar but not identical data. Participation rates for calendar years 1980, 1990, and 2000 and later were projected with the help of the Commission's sociologist. The participation rates developed are shown in Table 8. Intermediate year participation rates were obtained by interpolation.

On examining Table 8, it can be seen that some participation rates exceed 100 per cent. This is attributable to the fact that there are temporary workers in the country in any year who do not show up in the population counts.

The zero YBE participation rates were adjusted to YBE participation rates by the use of cumulative distributions of contributors and earnings for the 11 age-group sex cells. Some eighty earnings ranges are used for each age-group sex cell.

Modified Average Earnings

For calendar years 1971 to 1975, average earnings were developed assuming a zero YBE for each calendar year age-group sex cell by dividing total earnings by the total number of contributors in each sex cell. These were developed for both Canada (less Quebec) and Ontario, and extended back to 1966 using similar but not identical data. These average earnings are shown in Table 9.

For calendar years 1976 and 1977, it was assumed that total average earnings (for all age-groups and both sexes combined) would increase at the same annual rate as the Industrial Composite Index of Average Wages and Salaries. For 1978 and later years, the rates postulated in the economic assumptions were applied. After discussions with the Commission's sociologist it was decided that no differentiation should be made in the relative positioning of wages and salaries by age and/or sex in future years.(4)

Modified average earnings, reflecting only earnings above the projected YBE and up to the projected YMPE in each calendar year, were

developed using the cumulative distributions of contributors and earnings described above in "Participation Rates."

The effect of unemployment was not explicitly introduced into the calculations.

Table 8(a)
Zero YBE Participation Rates, Males, Canada Less Quebec

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.825	.828	.869	.822	.791	.829	.875	.899	.911	.931	.940	.940	.940
20-24	1.022	.993	1.032	1.007	1.010	.978	.995	1.004	1.009	.988	1.005	1.005	1.005
25-29	1.041	1.039	1.061	1.043	1.008	1.018	1.022	1.021	1.036	1.032	1.030	1.030	1.030
30-34	.934	.954	.998	.996	.994	.991	.998	.995	.981	.980	.990	.990	.990
35-39	.927	.944	.986	.980	.963	.964	.968	.977	.977	.982	.990	.990	.990
40-44	.920	.915	.955	.947	.954	.963	.972	.964	.959	.955	.970	.970	.970
45-49	.943	.932	.975	.968	.939	.929	.949	.949	.949	.954	.960	.960	.960
50-54	.879	.866	.903	.879	.903	.924	.933	.930	.926	.920	.930	.930	.930
55-59	.901	.863	.893	.885	.868	.861	.868	.876	.875	.889	.890	.890	.890
60-64	.829	.776	.812	.793	.790	.798	.804	.795	.791	.777	.800	.800	.800
65-69	.604	.523	.544	.513	.458	.441	.432	.429	.424	.426	.400	.375	.350

Table 8(b)
Zero YBE Participation Rates, Females, Canada Less Quebec

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.667	.672	.711	.672	.659	.691	.747	.773	.795	.824	.835	.850	.860
20-24	.749	.711	.764	.759	.757	.736	.766	.785	.806	.815	.820	.835	.855
25-29	.518	.507	.559	.569	.569	.594	.607	.624	.648	.674	.760	.785	.790
30-34	.379	.405	.452	.463	.480	.492	.519	.539	.561	.576	.690	.720	.725
35-39	.381	.415	.456	.463	.471	.485	.506	.538	.569	.598	.690	.720	.725
40-44	.421	.443	.475	.476	.487	.498	.518	.536	.561	.581	.690	.720	.725
45-49	.462	.470	.498	.500	.490	.488	.504	.519	.539	.558	.635	.660	.665
50-54	.420	.422	.447	.441	.456	.470	.479	.486	.501	.507	.545	.570	.580
55-59	.388	.376	.392	.379	.394	.392	.398	.409	.420	.440	.485	.510	.520
60-64	.279	.265	.208	.286	.294	.303	.306	.304	.308	.309	.330	.400	.480
65-69	.150	.135	.139	.137	.129	.134	.128	.127	.125	.135	.150	.180	.210

Table 8(c)
Zero YBE Participation Rates, Males, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	1.092	1.027	.949	.877	.837	.851	.902	.931	.916	.891	.900	.900	.900
20-24	1.082	1.091	1.088	1.062	1.053	1.003	1.017	1.028	1.010	.965	1.000	1.000	1.000
25-29	1.085	1.112	1.092	1.075	1.039	1.043	1.045	1.041	1.023	1.005	1.010	1.010	1.010
30-34	1.014	1.015	1.019	1.022	1.022	1.011	1.017	1.004	.976	.963	.980	.980	.980
35-39	.996	1.010	1.003	1.001	.986	.981	.987	.992	.983	.978	.980	.980	.980
40-44	.991	.990	.975	.971	.980	.981	.984	.978	.968	.956	.965	.965	.965
45-49	.981	1.010	1.011	1.001	.975	.956	.969	.964	.966	.965	.965	.965	.965
50-54	.947	.961	.928	.915	.943	.964	.966	.960	.951	.939	.950	.950	.950
55-59	.945	.949	.934	.931	.912	.905	.899	.899	.897	.911	.900	.900	.900
60-64	.857	.850	.853	.842	.838	.837	.833	.822	.817	.799	.810	.810	.810
65-69	.625	.522	.587	.562	.506	.493	.448	.445	.428	.398	.400	.375	.350

Table 8(d)
Zero YBE Participation Rates, Females, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1980	1990	2000
18-19	.888	.865	.794	.732	.717	.741	.804	.823	.814	.779	.835	.850	.860
20-24	.815	.830	.844	.832	.821	.779	.816	.834	.853	.850	.850	.865	.890
25-29	.557	.604	.632	.636	.632	.652	.661	.673	.682	.703	.775	.800	.810
30-34	.472	.497	.516	.520	.539	.547	.572	.585	.596	.608	.700	.725	.735
35-39	.490	.518	.517	.515	.522	.534	.551	.583	.610	.637	.700	.725	.735
40-44	.523	.538	.534	.527	.537	.545	.562	.580	.604	.622	.700	.725	.735
45-49	.524	.557	.561	.554	.541	.534	.546	.559	.576	.594	.665	.685	.695
50-54	.478	.487	.497	.487	.528	.520	.524	.530	.538	.543	.575	.600	.610
55-59	.439	.450	.431	.432	.429	.430	.431	.443	.454	.473	.510	.535	.545
60-64	.303	.316	.321	.316	.322	.323	.325	.322	.327	.322	.345	.415	.495
65-69	.155	.138	.158	.156	.148	.151	.134	.132	.129	.130	.150	.180	.210

Table 9(a)
Adjusted T1 and T4 Reported Average Earnings, Males, Canada

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,339	1,665	1,775	1,835	1,856	1,943	2,216	2,705	3,296	3,580
20-24	2,923	3,501	3,659	3,929	4,110	4,320	4,593	5,176	5,997	6,626
25-29	4,741	5,206	5,574	6,057	6,428	6,878	7,372	8,066	9,112	10,110
30-34	5,796	6,209	6,713	7,347	7,877	8,318	9,075	10,024	11,327	12,576
35-39	6,354	6,820	7,349	8,086	8,692	9,025	9,877	10,925	12,358	13,751
40-44	6,582	7,107	7,667	8,426	9,000	9,344	10,222	11,352	12,854	14,310
45-49	6,579	6,964	8,184	8,331	8,938	9,206	10,089	11,237	12,821	14,323
50-54	6,254	6,772	7,183	7,879	8,425	8,714	9,560	10,718	12,319	13,782
55-59	5,993	6,307	6,724	7,363	7,899	8,049	8,829	9,888	11,355	12,758
60-64	5,569	5,681	6,112	6,532	7,020	7,005	7,616	8,534	9,828	10,994
65-69	4,452	3,838	4,372	4,513	4,658	4,786	5,299	6,016	6,954	7,068

Table 9(b)
Adjusted T1 and T4 Reported Average Earnings, Females, Canada

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	965	1,230	1,343	1,360	1,406	1,440	1,578	1,836	2,215	2,547
20-24	2,026	2,339	2,509	2,715	2,924	3,081	3,227	3,507	4,071	4,752
25-29	2,549	2,633	2,883	3,187	3,510	3,830	4,081	4,427	5,056	5,938
30-34	2,475	2,564	2,775	3,032	3,336	3,621	3,904	4,294	4,963	5,846
35-39	2,563	2,679	2,866	3,166	3,433	3,643	3,949	4,332	5,020	5,921
40-44	2,623	2,792	2,987	3,347	3,623	3,810	4,118	4,512	5,185	6,074
45-49	2,732	2,931	3,129	3,463	3,720	3,901	4,221	4,616	5,299	6,190
50-54	2,919	3,062	3,256	3,634	3,857	3,972	4,286	4,673	5,345	6,202
55-59	3,014	3,183	3,374	3,721	4,043	4,065	4,356	4,707	5,355	6,154
60-64	3,029	3,134	3,309	3,709	3,983	3,946	4,206	4,533	5,141	5,911
65-69	2,759	2,592	2,720	2,895	2,910	2,913	3,131	3,359	3,806	4,107

Table 9(c)
Adjusted T1 and T4 Reported Average Earnings, Males, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,399	1,725	1,826	1,861	1,883	1,932	2,188	2,568	3,161	3,369
20-24	3,022	3,600	3,773	4,016	4,241	4,442	4,662	5,150	6,000	6,465
25-29	4,891	5,394	5,754	6,233	6,649	7,162	7,649	8,269	9,228	10,144
30-34	6,033	6,448	6,993	7,601	8,129	8,737	9,546	10,404	11,577	12,730
35-39	6,609	7,049	7,673	8,420	9,072	9,539	10,428	11,394	12,691	13,997
40-44	6,586	7,378	8,012	8,837	9,440	9,933	10,877	11,889	13,248	14,583
45-49	6,935	7,327	8,646	8,813	9,403	9,855	10,777	11,827	13,252	14,651
50-54	6,627	7,132	7,629	8,388	8,992	9,483	10,360	11,356	12,795	14,200
55-59	6,357	6,686	7,137	7,868	8,468	8,850	9,691	10,625	11,930	13,258
60-64	5,947	6,042	6,516	7,008	7,573	7,725	8,382	9,123	10,327	11,585
65-69	4,724	4,057	4,686	4,854	5,065	5,240	5,750	6,267	7,115	8,102

Table 9(d)
Adjusted T1 and T4 Reported Average Earnings, Females, Ontario

Age group	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
18-19	1,047	1,321	1,422	1,431	1,463	1,492	1,607	1,859	2,217	2,481
20-24	2,116	2,454	2,632	2,841	3,051	3,196	3,352	3,623	4,153	4,767
25-29	2,622	2,729	2,983	3,309	3,617	3,950	4,236	4,590	5,203	6,042
30-34	2,530	2,634	2,858	3,130	3,449	3,781	4,084	4,538	5,120	5,973
35-39	2,652	2,754	2,959	3,300	3,570	3,798	4,118	4,491	5,166	6,081
40-44	2,699	2,880	3,068	3,479	3,769	3,952	4,283	4,667	5,354	6,202
45-49	2,834	3,014	3,236	3,577	3,848	4,037	4,387	4,781	5,442	6,285
50-54	3,033	3,190	3,375	3,798	4,020	4,150	4,492	4,828	5,473	6,295
55-59	3,100	3,281	3,489	3,896	4,228	4,263	4,587	4,899	5,526	6,309
60-64	3,125	3,233	3,440	3,877	4,158	4,125	4,437	4,730	5,330	6,093
65-69	2,785	2,644	2,801	2,893	2,902	3,032	3,242	3,495	4,174	4,187

Contributions and Expenses of Administration

- a) Contributory earnings were calculated as the product of (i) Modified Average Earnings less the Year's Basic Exemption, (ii) participation rates, and (iii) projected populations. In the past, contributions estimated in accordance with the foregoing method have always been less than contributions actually collected. However, the difference has been narrowing and by 1977 was reduced to nil. In view of this trend, no special adjustment was made to the calculation of contribution income.
- b) To estimate contributions, the contribution rates assumed in the fund accumulations were applied to contributory earnings.
- c) Costs of administration were assumed to be at the level of .1 per cent of contributory earnings.

Other Methodology and Assumptions Consistent With Those Adopted by the Department of Insurance

As the computer program utilized by the federal Department of Insurance was used for the CPP financial projections, it was important to examine their methodology and to review their assumptions to be satisfied they were appropriate. This analysis was undertaken and the methodology and assumptions used for determining benefits were found to be acceptable. Accordingly the methodology and assumptions given on pages 50 through 58 of the CPP Statutory Actuarial Report No. 6 as at December 31, 1977 have not been repeated here. It can be assumed however, that the manner in which the Commission approached the calculation of benefits in the following areas mirrors those used by the Department of Insurance:

- Retirement benefits
- Disability benefits
- Children of disabled contributors' benefits
- Surviving spouses' benefits
- Orphans' benefits
- Death benefits
- Modifications for division of credits on divorce.

One exception to the foregoing applies in the case of the valuation of disability benefits in payment at the end of 1975. In the case of the valuation undertaken for residents of the province of Ontario, it was determined from an analysis of the data provided that 56 per cent of the existing CPP disabled population would be allocated to that province.

A second exception applies to the "divorce and divide" provision. While this provision has some effect on the subdivision of benefits by various categories, particularly on subdivisions by sex of the contrib-

utor, it has very little effect on the aggregate level of benefits. For such purposes it might have well been ignored. In fact, for the sake of convenience, it was ignored in estimating entry age normal costs and the related unfunded liabilities referred to below.

Fund Accumulations

The Fund was assumed to be the amount to the credit of the Canada Pension Plan Account. Annual investments in provincial bonds prior to 1978 are known, but for various reasons are less in total than the amount to the credit of the Canada Pension Plan Account at December 31, 1977. They were adjusted proportionately so as to match the said credit. The annual amounts of interest earned on each year of investments made prior to 1978 are also known, and were adjusted in proportion to the adjustments in investments. Amounts invested in each future year were taken as equal to contributions for the year minus benefits for the year, plus one year's interest on outstanding investments, plus prior investments matured during the year. Each future year's investments are assumed to earn interest until maturity at the annual rate of interest on new investments as postulated in the economic assumptions for the year of investment. The Fund at the end of any year was taken as the sum of the outstanding investments.

Normally, investments are assumed to mature after 20 years. However, if the amount to be invested in any year, calculated as indicated above, and assuming 20-year maturities, should turn out to be negative, it is necessary to assume additional maturities in that year sufficient to provide a positive investment. Otherwise, there would not be sufficient funds released in that year to pay benefits. Such additional maturities were assumed to be on a last-in, first-out basis.(5)

Entry Age Normal Cost and Related Unfunded Liability

a) Entry Age Normal Cost

This was determined by estimating contributory earnings and benefits and expenses in respect of the quinary age-group cohort centred around age 18 on December 31, 1977, and determining, by an iteration process, and using the usual fund accumulation methods, the contribution rate that would be exactly sufficient to accumulate a nil fund in respect of that cohort at the expiration of all contributions and expenditures in respect of that cohort. The entry age normal cost was taken as the contribution rate so determined.

b) Unfunded Liability

The unfunded liability, assumed to be hypothetically invested in 1978, was determined by an iteration process so that together with (i) the fund at December 31, 1977, (ii) future (post-1977) contri-

butions at the entry-age-normal cost contribution rate collected in respect of the population aged 18 and over on December 31, 1977 and (iii) investment earnings, it would be just sufficient, to pay all future benefits and administrative expenses in respect of that population. The unfunded liability so calculated at December 31, 1977, was then discounted for one-half year's interest.

An accumulation process was used to determine both the entry-age-normal costs and the unfunded liability, rather than the more usual discounting process, because the interest assumptions (annual rates of interest on new investments), together with the maturity assumptions used in the Fund accumulation, are readily conducive to the accumulation of funds, but not to their discounting.(6)

FINANCIAL PROJECTIONS UNDERTAKEN

The Commission requested that a number of population and financial projections be undertaken for the CPP. Six sets of projections were requested providing a broad range of financial information for calendar years 1978 through 2050. The four population scenarios described above, (essentially variations in fertility assumptions) and the three economic scenarios previously described, formed the basis for the projections undertaken.

The table below summarizes the six projections:

<u>Economic assumptions</u>	<u>Fertility assumptions</u>			
	<u>Low/low</u>	<u>Low</u>	<u>Most probable</u>	<u>High</u>
Low			X	
Most probable	X	X	X	X
High			X	

All of the six foregoing projections were made for Canada. A seventh projection was made for Ontario, based on the most probable economic and most probable fertility assumptions and a fund based on Ontario's share of the CPP assets as of December 31, 1977.

Two additional projections were made for Canada using the most probable fertility assumptions but varying the earnings assumption ± 0.5 per cent from the rates for 1979 and later years that were otherwise included in the most probable economic assumptions. A last set of projections was made to measure the financial implications of reintroducing the earnings test. This was also based on the most probable fertility and economic assumptions.

All nine projections developed the following information for calendar years 1978 to 2050:

- a) Contributory earnings;
- b) Expenditures split into retirement (including the continuation of the retirement pension to survivors), disability and survivor(7) benefits, with all three of these benefit components separated into their non-indexed and indexed portions.
- c) Expenses of administration, set at one-tenth of one per cent of contributory earnings;
- d) Items b) and c) expressed as a percentage of contributory earnings;
- e) Net cash flow (contributions less expenditures, including expenses);
- f) Investment income;
- g) The accumulated fund for the various "Funds" developed.

Although not included as a part of the computer output, the fund accumulations (item g) were expressed as a multiple of the current year's benefit expenditures (item b). This payout multiple is a much more meaningful statistic since it gives a rough indication of the number of years the then fund value could cover future benefit payments under the plan, without any additional contributions to the CPP. As such it could be considered a solvency safeguard.

The splitting-out of the costs of indexing separately from the basic benefits provided by the CPP at the time of the event (death, disability, retirement), to the best of our knowledge has never been done before. The split between retirement, disability, and survivor benefits is consistent with the manner in which the Department of Insurance has presented such information in the past. In this connection it should be noted that the "retirement" category includes the pension to the contributor and the continuation, if any, of such retirement pension to survivors. The "survivors" category picks up all other pre-retirement survivor and death benefits.

Funds A, B, and C were developed for all nine projections. They can be described as follows:

	Description
Fund A	The fund accumulations that will result starting with today's fund and contributions continuing indefinitely at the current combined employee-employer rate of 3.6 per cent.
Fund B	Under this fund, contributions continue at the combined 3.6 per cent employee-employer rate up to the point where the cash flow to the provinces (contributions less expenditures) would otherwise become negative. At this point,

contributions are increased so that there is always a zero cash flow to the provinces. Under this arrangement the fund will continue to grow by the amount of interest earned on the fund and the provinces will not be required to pay interest. Instead, the interest would be capitalized each year.

Fund C Under this fund, cash flow is permitted to become negative up to the point where the interest payments on the fund, along with the 3.6 per cent employee-employer contributions, are both required to meet the expenditures for the year. Thereafter, contributions are increased so that contributions plus fund interest will exactly cover expenditures. This leads to a constant or stable fund and a situation where the provinces will be required to pay interest on this frozen fund thereafter.

The first seven projections described (six for Canada and one for Ontario) developed, in addition to Funds A, B, and C, projections for three other funds referred to as Funds D, E, and F. These will be described later. Each of these projections required that entry age normal contribution rates and associated unfunded liabilities be developed.

The following summarizes the details of the seven projections undertaken.

1. Entry age level contributions, as a percentage of contributory earnings, were developed for the following benefits:
 - a) Contributor retirement pensions, including their continuation to survivors, without indexing;
 - b) Disability pensions without indexing;
 - c) Survivors' pensions(7), orphans' and death benefits without indexing.
 - d) Contributor retirement pensions, including their continuation to survivors, with indexing;
 - e) Disability pensions with indexing;
 - f) Survivors' pensions(7), orphans' and death benefits with indexing;
 - g) Total of non-indexed and indexing components (see Appendix D-6).

Expenses were not reflected in the Entry Age costs for the specific benefit items.

The objective here was to develop one entry age normal value for each of the benefit components referred to above.

2. Using a closed group valuation technique, the unfunded actuarial liability for CPP participants as of December 31, 1977 was developed.

Five separate unfunded actuarial liabilities were developed as follows based on:

- a) Contributor retirement pensions, including their continuation to survivors, (without indexing) - item a) of paragraph 1 used as entry age level contribution;
- b) Welfare benefits - disability pensions, survivors' (7) pensions, orphans' and death benefits (without indexing) - sum of items b) and c) of paragraph 1 used as entry age level contribution;
- c) As for item a) with indexing - item d) of paragraph 1 used as entry age level contribution;
- d) As for item b) with indexing - sum of items e) and f) of paragraph 1 used as entry age level contribution;
- e) Items a) through f) plus administrative expenses - entry age level cost used is item g) of paragraph 1, plus one-tenth of one per cent.

CPP assets as of December 31, 1977 were allocated to items a) and b) above based on a pro rata share of the present value of future benefits for each category. Assets were not allocated to items c) and d) since there was always an unfunded position created for the benefits covered by items a) and b).

Contributions in calendar years 1979 and 1980 were allocated to items a) through d) above in proportion to related pay-go contributions in such years, both years' contributions including administrative expenses of one-tenth of one per cent.

3. Using the information generated in paragraphs 1 and 2, financial projections were developed portraying the fund build-up that would occur if entry age level funding were applied to all current and future CPP contributors (open group valuation). In addition, such contributors were assumed to pay an increased CPP contribution to cover the amortization of the December 31, 1977 unfunded liability developed for the closed group of contributors and beneficiaries as of that date (developed in paragraph 2), assuming such unfunded liability was to be amortized as a percentage of projected future covered CPP payroll over the 50-year period commencing January 1, 1980 and ending in the year 2029. The choice of 50 years for amortizing the unfunded actuarial liability was based on the knowledge

that the youngest members of the population who represent the baby boom will have reached retirement age by the year 2030.

Three sets of projections (Fund D, Fund E, and a modification to Fund E, referred to as Fund F), were undertaken to determine the relative impact of adopting entry age level contribution patterns for all or part of the CPP benefit package in lieu of pay-go funding. Details of the funding methods applied to the benefit components for each of the three fixed bases follow:

Fund basis	Funding method to be used							
	Non-indexed portion				Indexed portion			
	Retirement		Welfare		Retirement		Welfare	
	pensions		benefits(a)		pensions		benefits(a)	
	Entry	Pay	Entry	Pay	Entry	Pay	Entry	Pay
	age	go	age	go	age	go	age	go
D	X		X		X		X	
E	X			X	X			X
F	X			X		X		X

a Includes both disability and survivor benefits.

NOTE: Where entry age contributions are noted above, the 50-year amortization payment to cover the closed group December 31, 1977 unfunded actuarial liability associated with that particular component was included as a part of the required contribution. In the instance where pay-go funding was to apply to a specific component to which assets have been allocated, such assets were first applied to reduce the pay-go costs until the fund was exhausted.

Each of the four components - Retirement (without indexing), Welfare (without indexing), Retirement(8) (indexed portion) and Welfare (indexed portion) - as well as the overall total, had separate fund accumulations developed.

4. The reintroduction of the earnings test was examined using the retirement factors specified below. These projections were developed for Funds A through F.

	Retirement factors applicable to 65-69 age group
Males	.80
Females	.90

The earnings test assumed was identical to the one initially in place at the outset of the CPP, i.e., no offset for earned income up to 18 per cent of the YMPE, \$1 offset for each \$2 of earned income between 18 per cent and 30 per cent of the YMPE and a \$1 for \$1 offset above 30 per cent. The retirement factors adopted, .80 for males and .90 for females, were established as the result of a

detailed examination of the experience available under the Quebec Pension Plan. No similar data were available for the CPP.

The level of contributory earnings to the Plan was also increased as the result of continued participation of workers in the 65-69 age group by applying the above retirement factors to the participation rates, adjusted from a zero to a YBE basis, to arrive at the number contributing. This technique led to the following approximate results for the year 2000:

	Percentage of 65-69 age group that		
	<u>Retire</u>	<u>Contribute to CPP</u> (Per cent)	<u>Total(a)</u>
Males	80	25	105
Females	90	15	105

a Percentages exceed 100 since in the year of retirement an individual can be both a contributor and a pension recipient.

Minor changes occur in the contributor percentages for years prior to 2000.

EXTRA POPULATION ARISING FROM THE BABY BOOM

In order to measure the financial implications on the CPP of the high fertility rates during the 1945-1965 period (referred to as the "baby boom"), the Commission decided that the most meaningful technique would be to determine the extra population that resulted from the boom. This required the Commission to establish a "norm" fertility rate, above which the "extra population" would be determined.

Table 10 contains the actual total fertility rates for the period 1926-1975 along with the adjusted rates, the latter being the lesser of 3.0 (the established "norm") and the actual total fertility rate for each year. Table 11 depicts the extra population, the baby boom, pictorially. The norm of 3.0 was selected because it approximates the average total fertility rate between World Wars I and II.

The ratio of adjusted to actual total fertility ratios for each year of birth was then applied to the 1971 census population at each age (males and females separately) corresponding to the appropriate year of birth; e.g., the 1950 ratio was applied to the population age 21 from the 1971 census. The same ratios were applied to males and females, thereby retaining the ratio of male to female births at about 1.06.

The 1971 census population was adjusted before applying the ratios to eliminate the effect of immigration and emigration, since the higher birth rates of the 1945-1965 period would not be affected by either of these movements. Data for actual immigrants in each calendar year

were obtained from the Canada Year Book for each year in the period 1946-1965. The probability of death of the immigrant population was ignored, recognizing that mortality rates at ages up to 25 are extremely light in any event. Emigrants were arbitrarily set at 15 per cent of immigrants over the 21-year period. Emigrants to the United States (the only country for which such statistics are gathered) ranged from 6 per cent to 20 per cent during the same 21-year period. The number of immigrants to Canada since 1946 included in the 1971 census is shown in Table 12 distributed by quinquennial age groups. Migration from Quebec to the rest of Canada was ignored since it was felt this would not be a major contributing factor to the extra population.

The extra population resulting from the foregoing calculations is shown in Table 13. The "adjusted" 1971 population, i.e., the actual 1971 population reduced by the extra population, contained in Table 13, was then used to develop financial projections using the most probable economic and fertility assumptions for Funds A, B, and C for Canada less Quebec, and Ontario. The projections for the "adjusted" 1971 population developed the benefit outflow and contributory earnings in each calendar year along with the pay-go contribution rates, i.e., the ratio of benefit outflow to contributory earnings. The pay-go contribution rates resulting from the "adjusted" 1971 population were then compared with corresponding pay-go contribution rates resulting from projections using the actual 1971 population.

The excess of pay-go contribution rates for the actual 1971 population over the adjusted 1971 population was determined only for those years in which there was a positive result. Essentially positive excess pay-go contributions appeared in calendar years 2023 to 2037 and after the year 2045, with all other years showing negative results. The excess contribution rates were then applied to the actual 1971 population, discounted and amortized over varying periods of time ranging up to 50 years, and expressed as a percentage of contributory earnings.

Table 10
Actual and Adjusted Total Canadian Fertility Rates

	Actual TFR	Adjusted TFR
1926	3.356	3.356
1931	3.201	3.201
1936	2.695	2.695
1941	2.824	2.824
1942	2.954	2.954
1943	3.030	3.030
1944	3.000	3.000
1945	3.005	3.005
1946	3.356	3.000
1947	3.575	3.000
1948	3.423	3.000
1949	3.438	3.000
1950	3.433	3.000
1951	3.480	3.000
1952	3.621	3.000
1953	3.702	3.000
1954	3.812	3.000
1955	3.817	3.000
1956	3.849	3.000
1957	3.929	3.000
1958	3.884	3.000
1959	3.947	3.000
1960	3.910	3.000
1961	3.857	3.000
1962	3.773	3.000
1963	3.690	3.000
1964	3.521	3.000
1965	3.163	3.000
1966	2.826	2.826
1967	2.593	2.593
1968	2.445	2.445
1969	2.385	2.385
1970	2.310	2.310
1971	2.190	2.190
1972	2.024	2.024
1973	1.931	1.931
1974	1.875	1.875
1975	1.866	1.866

Table 11

TOTAL FERTILITY RATES IN CANADA

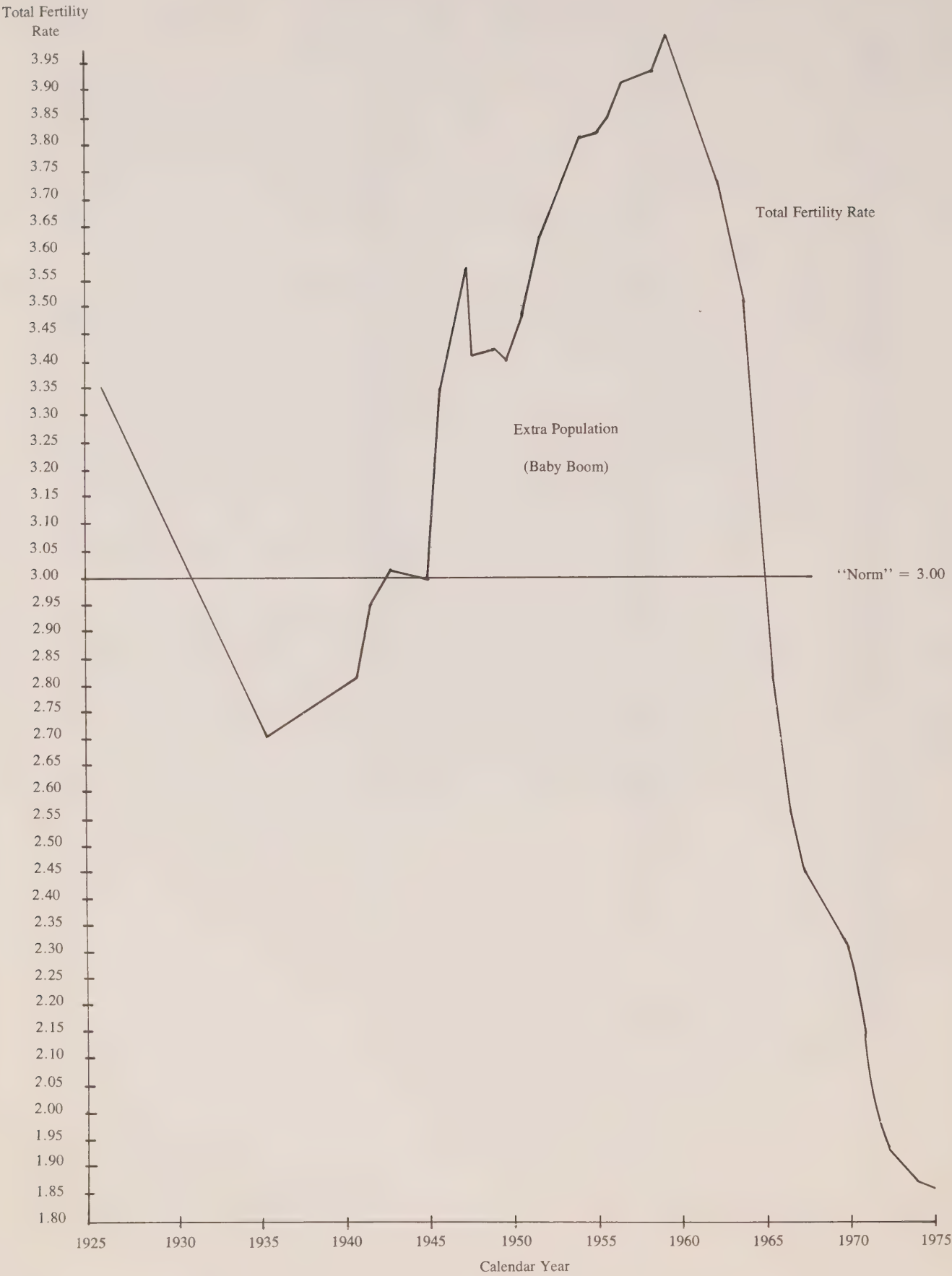


Table 12
Estimated Immigration to Canada

Year of birth	Age in 1971	Year of immigration					
		1947-51	1952-56	1957-61	1962-66	1967-71	1947-71
(Thousands)							
1967-71	0-4					60	60
1962-66	5-9				48	62	110
1957-61	10-14			38	54	57	149
1952-56	15-19		50	42	51	61	200
1947-51	20-24	39	51	39	50	180	359
ALL	ALL	554	762	690	622	838	3,466

Table 13
Extra Population in 1971 Resulting from High Fertility
in 1945-65 Period (Canada)

Age in 1971	Extra population	
	Males	Females
0-4	-	-
5	10,344	10,021
6	32,711	30,750
7	42,249	40,541
8	47,357	45,032
9	50,616	48,207
10	53,321	50,940
11	54,685	51,910
12	50,799	48,516
13	52,390	49,773
14	47,615	45,568
15	45,527	43,341
16	44,898	42,956
17	37,807	36,468
18	32,359	31,430
19	24,537	24,263
20	21,412	21,226
21	20,469	20,357
22	19,076	19,148
23	24,427	23,340
24	16,243	17,107
25+	-	-
Total	28,842	701,894

OLD AGE SECURITY AND INCOME SUPPLEMENTS

Financial projections for the federal Old Age Security (OAS) and Guaranteed Income Supplement/Spouse's Allowance (GIS/SA) programs, are based on instructions developed by the Ontario Royal Commission in co-operation with its various advisers. These projections are based entirely on the Commission's "most probable" fertility and economic assumptions, and are developed separately for all Canada, Canada less Quebec, and Ontario.

Projected OAS expenditures are set out for each region in the tables appearing in Appendix F to the report. The expenditures are expressed in terms of absolute dollars, and also as percentages of gross national or regional product (GNP) and of applicable contributory earnings under Canada/Quebec Pension Plan. In each case, three figures are shown:

1. based on a benefit level frozen at the January, 1979 rate (i.e., no pre- or post-retirement indexing);
2. based on a benefit level which increases in line with price inflation each year, but which is frozen for each recipient at the level in effect at his or her attainment of age 65 (i.e., no post-retirement indexing);
3. based on full price indexing before and after retirement.

Similar tables were developed projecting expenditures for GIS/SPA based on certain assumptions developed by Messrs. Powell and Martin of the federal Department of Health and Welfare in their paper "Economic Implications of an Aging Society in Canada" presented to the National Symposium on Aging, October 25-27, 1978. The projections include the effect of the increases in GIS and SA benefits which came into effect on January 1, 1979.

General Assumptions

All figures were derived by year-over-year adjustments to a known base, with inflation and population changes factored into all projections as follows:

Inflation

Inflation was assumed to follow the Commission's most probable economic scenario. The "non-indexed" projections of expenditures were made by taking inflation as zero. The figures for the "pre-retirement indexing only" projections were derived by an approximate adjustment to the "fully indexed" results, allowing for the inflation adjustment since retirement weighted by population in 5-year age groups.

Population

Population numbers by age group were taken from projections using the Commission's most probable fertility and other demographic assumptions.

Old Age Security Projection Method

The general approach is a modification of that used in the Powell-Martin paper, which calculated dollar OAS expenditures in future years by multiplying together

1. The projected population aged 65 and over in each year.
2. The anticipated OAS benefit level in each year.
3. An adjustment to convert population numbers to recipients.

Modifications to this basic approach have been made to allow for:

- partial OAS payments to immigrants and emigrants after June 30, 1977, based on years of residence, by an approximate adjustment to the age distribution of immigrants and emigrants in the underlying population projection;
- quarterly rather than annual adjustment of the numbers of recipients and the level of OAS benefit;
- regional distribution of the 65 and over population.

After testing the method against actual OAS payouts for Canada in fiscal years ending March 31, 1977 and 1978, it was decided to adjust for the proportion of the over-65 population actually receiving benefits by multiplying by .9923.

GIS and SA Projection Method

The 1978 calendar year was taken as the base for projection. As a first step, the anticipated total GIS payout in 1978 for Canada, Canada less Quebec, and Ontario was estimated as follows:

- the proportions of the total GIS payout in fiscal 1976-77 represented by each region were known. After adjustment for known changes in the number of recipients, these proportions were applied to the total GIS payout in fiscal 1977-78 to obtain the payout for each region in that period;
- these 1977-78 regional payouts were then extrapolated for nine months of inflation, population change, and expected reductions

in recipients and real benefits, to obtain the estimated payouts by region for calendar 1978.

Next, an adjustment was made to this 1978 base to recognize the increased benefits that will result from the \$20 per month per household increase and improved spouse's allowance benefits effective January 1, 1979. The total additional payment in fiscal 1979-80 for this amendment was estimated at \$290 million for Canada as a whole in a Department of Health and Welfare press release dated October 17, 1978. The provincial components also given in the release were used to adjust the 1978 base after appropriate reduction for population and inflation changes.

The resulting notional 1978 base of total GIS payout in \$ millions was:

	<u>Canada</u>	<u>Canada less Quebec</u>	<u>Ontario</u>
Before adjustment for 1/1/79 changes	1,132	800	330
Adjustment for 1/1/79 changes	235	168	72

SA benefits were included by adding 11 per cent to the GIS payouts. The GIS plus SA payouts in subsequent years were then developed by multiplicative adjustments to the 1978 base for:

1. Inflation.
2. Changes in the total population in each region aged 65 and over.
3. Reduction in the proportion of GIS recipients in the 65 and over population.
4. Reductions in the average real benefit payout.

Assumptions for GIS/SA Projection

The proportion of the population aged 65 and over which is receiving GIS benefits was assumed to reduce each year by the following alternative sets of percentages, compounded:

	<u>Powell and Martin</u>	<u>Royal Commission</u>
	(Per cent)	
Until 1991	1.6	1.0
1992 and later years	.0	.5

Real Benefit Amount

The average benefit per recipient was assumed to reduce in real terms by the following alternative sets of percentages, compounded:

	<u>Powell and Martin</u>	<u>Royal Commission</u>
Until 1991	1.4	.5
1992 and later years	1.0	.0

Gross National or Regional Product (GNP)

GNP for Canada was available up to and including the third quarter of 1978. Gross provincial products for Ontario and Quebec were available up to and including calendar 1977. These were then expressed as percentages of the national level per head of the working population taken as the projected male plus female population aged 18 to 64 inclusive. The calendar 1978 base for each region was then derived by adjusting for population change and inflation. This base was then projected into the future by including increases for:

- inflation as under the Commission's most probable economic scenario;
- a real growth rate of 2 per cent per annum, compounded;
- growth in the working population.

Contributory Earnings Under CPP and QPP

CPP earnings were taken from the projection based on the Commission's most probable economic and demographic assumptions. QPP earnings were supplied by the Quebec Pension Board based on assumptions in the December 31, 1974 report adjusted for the change in the retirement/earnings test. The QPP assumptions are reasonably similar to those used by the Commission.

NOTES

- (1) For details see Department of Insurance, Ottawa, Canada Pension Plan Actuarial Report No. 6, as at December 31, 1977, p. 40. This report is referred to in the text as "Statutory Actuarial Report No. 6."
- (2) Ibid., p. 38.
- (3) Long-term price, wage, and nominal interest rate forecasts must be consistent. The fact that higher inflation rates are associated with higher nominal interest rates is perfectly rational, and is explained by both borrowers and lenders of funds accepting that their loan contract must be ultimately validated in terms of real purchasing power. In a similar fashion, money wage changes, and price level changes are linking to maintain real purchasing power.
- (4) Compare the approach taken in Statutory Actuarial Report No. 6, p. 48.
- (5) This section on Fund Accumulation is taken from Statutory Actuarial Report No. 6, p. 58.
- (6) This section was taken from Statutory Actuarial Report No. 6, pp. 58 and 59.
- (7) This includes all survivors' pensions except those payable to survivors of those actually retired.
- (8) Includes continuation to survivors.

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APPENDIX A - POPULATION PROJECTIONS

(All based on the Royal Commission's most probable fertility and immigration assumptions.)

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Projected Male Population, by Age Group, Canada, as of July 1, 1970-2050

Appendix A-1

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	978	914	1094	1353	1389	1213	1127	1198	1316	1373	1347	1311	1322	1374	1421	1437	1436
5- 9	1182	991	925	1102	1361	1397	1222	1137	1207	1325	1382	1356	1320	1332	1383	1430	1446
10-14	1178	1210	1000	932	1109	1367	1404	1229	1144	1214	1332	1389	1363	1327	1339	1391	1437
15-19	1077	1196	1215	1005	937	1114	1371	1408	1233	1149	1219	1336	1393	1367	1331	1343	1394
0-19	4415	4311	4234	4392	4796	5091	5124	4972	4900	5061	5280	5392	5398	5400	5474	5601	5713
20-24	957	1108	1214	1231	1023	957	1132	1388	1424	1251	1168	1237	1353	1409	1384	1348	1360
25-29	790	1013	1142	1241	1259	1054	989	1164	1417	1453	1282	1199	1267	1382	1438	1412	1377
30-34	667	839	1036	1158	1258	1276	1073	1009	1182	1433	1469	1299	1217	1284	1399	1454	1429
35-39	662	687	847	1038	1160	1259	1278	1077	1014	1185	1434	1470	1301	1220	1287	1400	1455
40-44	654	666	687	842	1031	1152	1250	1268	1070	1008	1178	1424	1459	1292	1212	1279	1391
45-49	614	643	656	675	828	1013	1132	1228	1247	1053	992	1159	1401	1436	1273	1195	1261
50-54	523	600	623	636	654	802	982	1098	1192	1210	1023	965	1128	1363	1397	1239	1164
55-59	473	489	569	590	603	621	763	934	1045	1135	1154	976	922	1078	1304	1337	1188
60-64	376	436	449	522	542	555	573	704	863	967	1051	1069	906	857	1005	1216	1248
20-64	5716	6481	7223	7933	8358	8689	9172	9870	10454	10695	10751	10798	10954	11321	11699	11880	11873
65-69	288	329	380	392	457	477	488	506	624	766	861	937	956	812	770	905	1098
70-74	205	236	266	309	320	374	392	403	420	519	640	722	788	806	687	654	773
75-79	143	148	172	194	227	236	277	292	301	316	393	486	550	603	619	529	506
80-84	86	87	92	107	122	144	151	178	188	195	206	259	321	367	403	416	357
85-89	39	42	42	46	54	62	74	79	94	101	105	113	143	180	207	230	239
90+	13	16	18	19	20	24	29	36	40	48	53	58	64	80	103	124	143
65-90+	774	858	970	1067	1200	1317	1411	1494	1667	1945	2258	2575	2822	2848	2789	2858	3116
Total	10905	11650	12427	13392	14354	15097	15707	16336	17021	17701	18289	18765	19174	19569	19962	20339	20702

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	939	868	1037	1282	1317	1149	1068	1134	1246	1300	1275	1241	1251	1300	1344	1360	1359
5- 9	1127	952	879	1044	1290	1324	1157	1077	1143	1255	1309	1284	1249	1261	1309	1353	1369
10-14	1128	1154	961	886	1051	1297	1331	1165	1084	1151	1262	1316	1291	1257	1268	1317	1361
15-19	1041	1144	1162	968	893	1059	1304	1339	1173	1092	1158	1270	1324	1299	1265	1276	1324
0-19	4235	4118	4039	4180	4551	4829	4860	4715	4646	4798	5004	5111	5115	5117	5186	5306	5413
20-24	947	1086	1169	1183	991	917	1083	1328	1363	1197	1117	1183	1294	1348	1323	1289	1300
25-29	762	1006	1121	1198	1213	1022	950	1116	1360	1394	1229	1149	1215	1326	1380	1356	1322
30-34	639	803	1027	1137	1215	1230	1041	969	1134	1377	1412	1248	1168	1234	1345	1398	1374
35-39	626	654	813	1033	1143	1220	1236	1048	976	1141	1383	1418	1254	1175	1241	1351	1405
40-44	634	632	657	812	1031	1140	1217	1234	1047	976	1140	1381	1416	1253	1175	1240	1350
45-49	621	630	629	653	806	1023	1132	1208	1225	1040	970	1133	1371	1406	1245	1168	1233
50-54	529	619	622	620	644	796	1009	1116	1192	1208	1027	959	1119	1355	1389	1231	1156
55-59	474	512	606	608	607	630	779	987	1092	1166	1183	1006	940	1098	1329	1362	1208
60-64	386	463	495	584	586	586	609	752	953	1054	1126	1143	974	911	1064	1288	1321
20-64	5618	6405	7139	7828	8236	8564	9056	9758	10342	10553	10587	10620	10751	11106	11491	11683	11669
65-69	316	366	435	465	549	553	553	577	713	904	1002	1072	1089	929	870	1018	1233
70-74	248	284	328	391	419	496	501	502	525	651	827	919	985	1003	857	805	945
75-79	185	206	236	274	328	353	419	424	427	448	558	710	792	851	868	744	701
80-84	116	132	152	175	204	247	267	319	325	329	348	437	559	627	677	694	598
85-89	56	69	79	92	108	127	156	171	206	212	218	233	296	383	434	472	489
90+	22	29	37	44	52	63	77	96	110	134	147	155	169	212	276	332	376
65-90+	943	1086	1267	1441	1660	1839	1973	2089	2306	2678	3100	3526	3890	4005	3982	4065	4342
Total	10796	11609	12445	13449	14447	15232	15889	16562	17294	18029	18691	19257	19756	20228	20659	21054	21424

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Male Population, by Age Group, Canada Less Quebec, as of July 1, 1970-2050

Appendix A-3

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0- 4	714	692	820	1001	1029	915	869	930	1015	1052	1036	1021	1041	1084	1118	1131	1137
5- 9	845	732	708	833	1013	1041	926	880	941	1025	1063	1047	1032	1052	1095	1129	1142
10-14	834	875	745	719	843	1023	1049	935	889	950	1034	1071	1056	1041	1061	1104	1138
15-19	758	853	884	753	727	850	1028	1055	940	895	956	1039	1076	1061	1046	1066	1109
0-19	3151	3152	3157	3306	3612	3829	3872	3800	3785	3922	4089	4178	4205	4238	4320	4430	4526
20-24	673	792	873	902	772	746	868	1045	1071	958	913	973	1056	1093	1077	1062	1083
25-29	550	734	827	903	932	803	777	899	1074	1100	987	943	1002	1084	1120	1105	1090
30-34	474	602	761	849	924	952	823	798	918	1092	1118	1006	962	1021	1102	1138	1123
35-39	474	500	616	770	857	931	958	830	805	924	1097	1122	1012	968	1026	1107	1143
40-44	472	485	505	617	769	855	927	953	828	803	921	1091	1116	1008	964	1022	1102
45-49	446	469	482	500	610	758	842	913	939	816	792	908	1076	1101	994	952	1009
50-54	383	441	457	469	487	593	737	818	887	913	794	771	885	1048	1072	969	929
55-59	349	362	421	435	447	464	565	702	780	847	872	759	738	847	1003	1027	929
60-64	278	325	334	388	402	413	429	523	650	723	785	809	705	687	790	936	959
20-64	4099	4710	5276	5833	6200	6515	6926	7481	7952	8176	8279	8382	8552	8857	9148	9318	9367
65-69	217	245	285	294	341	355	365	380	465	579	645	702	724	633	617	712	846
70-74	156	179	199	233	241	281	293	302	316	388	484	542	591	612	536	524	607
75-79	111	113	131	147	172	179	209	219	227	239	294	368	414	453	470	413	406
80-84	69	69	71	83	93	110	115	135	142	148	157	195	245	276	303	316	279
85-89	32	35	34	36	42	48	58	61	72	77	80	86	108	137	157	173	182
90+	11	14	15	15	17	20	23	28	31	37	41	45	49	61	79	94	108
65-90+	596	655	735	808	906	993	1063	1125	1253	1468	1701	1938	2131	2172	2162	2232	2428
Total	7846	8517	9168	9947	10718	11337	11861	12406	12990	13566	14069	14498	14888	15267	15630	15980	16321

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Female Population, by Age Group, Canada Less Quebec, as of July 1, 1970-2050

Appendix A-4

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0-4	685	658	778	950	976	868	824	882	962	997	982	967	986	1027	1059	1071	1076
5-9	806	703	674	791	962	988	878	835	892	972	1007	992	978	997	1038	1070	1082
10-14	796	834	716	684	801	971	996	887	843	901	981	1016	1001	987	1006	1046	1079
15-19	733	816	845	725	694	810	979	1004	895	852	909	989	1024	1009	995	1014	1055
0-19	3020	3011	3013	3150	3433	3637	3677	3608	3592	3722	3879	3964	3989	4020	4098	4201	4292
20-24	664	778	844	871	751	719	834	1003	1028	920	876	934	1013	1048	1033	1019	1038
25-29	527	727	817	878	904	784	752	866	1035	1060	952	908	966	1045	1080	1065	1051
30-34	451	572	752	838	898	924	803	771	885	1054	1078	970	927	985	1064	1099	1084
35-39	441	472	585	762	847	907	932	812	780	894	1061	1086	979	936	993	1072	1107
40-44	451	452	478	589	764	849	908	932	813	782	895	1062	1086	980	938	994	1073
45-49	450	452	453	478	587	761	844	902	927	809	778	890	1056	1081	975	934	990
50-54	385	453	449	449	473	581	752	834	891	916	801	770	881	1044	1069	965	925
55-59	345	375	445	441	441	465	570	736	817	873	897	785	756	865	1025	1049	948
60-64	280	340	364	431	427	427	451	552	712	790	845	869	761	733	839	994	1018
20-64	3994	4621	5187	5737	6092	6417	6846	7408	7888	8098	8183	8274	8425	8717	9016	9191	9234
65-69	232	267	321	344	407	404	405	428	524	677	752	805	828	727	701	803	953
70-74	186	209	240	289	311	368	367	369	390	480	620	690	740	763	671	649	745
75-79	142	157	175	202	244	263	313	312	314	334	412	534	596	640	662	583	565
80-84	91	104	117	131	153	186	201	240	241	244	261	324	422	473	510	530	469
85-89	45	56	63	72	82	96	119	130	156	159	162	176	221	290	328	357	373
90 +	18	24	30	36	42	49	59	74	85	102	111	117	128	158	209	251	284
65-90 +	714	817	946	1074	1239	1366	1464	1553	1710	1996	2318	2646	2935	3051	3081	3173	3389
Total	7728	8449	9146	9961	10764	11420	11987	12569	13190	13816	14380	14884	15349	15788	16195	16565	16915

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Male Population, by Age Group, Ontario, as of July 1, 1970-2050

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0-4	341	335	396	485	500	444	421	451	494	516	510	503	512	534	554	563	566
5-9	407	352	342	402	490	506	450	427	457	500	522	517	509	518	541	560	569
10-14	399	425	358	346	406	495	510	455	432	462	505	527	522	514	523	546	565
15-19	361	410	429	361	350	410	498	514	459	436	466	509	531	525	517	527	549
0-19	1508	1522	1525	1594	1746	1855	1879	1847	1842	1914	2003	2056	2074	2091	2135	2196	2249
20-24	333	386	421	439	372	362	421	509	524	470	447	477	519	541	535	528	537
25-29	280	374	404	437	455	390	380	439	526	541	487	465	494	536	558	552	545
30-34	243	310	387	415	448	466	402	392	451	537	552	499	477	505	547	569	563
35-39	245	258	316	391	419	452	470	406	397	455	541	555	502	480	509	551	572
40-44	246	251	259	316	390	418	450	468	405	396	454	539	553	501	479	507	549
45-49	230	245	248	256	311	384	411	443	462	400	391	448	531	545	494	473	501
50-54	188	228	238	241	249	302	373	400	431	449	389	381	436	517	531	482	462
55-59	170	177	217	226	229	237	288	355	381	411	428	372	364	418	495	509	462
60-64	134	158	163	199	208	211	219	266	328	353	381	397	346	339	389	462	475
20-64	2069	2387	2653	2920	3081	3222	3414	3678	3905	4012	4070	4133	4222	4382	4537	4633	4666
65-69	104	117	138	142	175	183	186	193	236	292	314	340	355	310	305	351	418
70-74	74	85	95	112	116	143	150	154	160	196	244	263	286	300	262	259	300
75-79	49	53	62	69	82	86	106	112	115	120	149	185	201	219	230	202	200
80-84	28	30	33	39	44	52	55	68	72	74	79	98	122	134	146	155	136
85-89	13	14	15	16	19	22	27	29	36	39	40	43	54	68	75	83	89
90+	4	5	6	6	7	9	10	13	14	18	20	22	24	30	39	46	52
65-90 +	272	304	349	384	443	495	534	569	633	739	846	951	1042	1061	1057	1096	1195
Total	3849	4213	4527	4898	5270	5572	5827	6094	6380	6665	6919	7140	7338	7534	7729	7925	8110

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Female Population, by Age Group, Ontario, as of July 1, 1970-2050

Appendix A-6

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
0-4	326	319	376	460	474	421	399	427	468	489	484	476	485	506	525	533	536
5-9	387	337	325	381	465	480	427	405	433	474	495	490	482	491	512	531	539
10-14	380	404	342	330	386	470	484	432	410	438	479	500	495	487	496	517	536
15-19	351	391	409	347	334	390	474	489	436	415	443	484	505	499	492	501	522
0-19	1444	1451	1452	1518	1659	1761	1784	1753	1747	1816	1901	1950	1967	1983	2025	2082	2133
20-24	333	379	405	421	360	348	404	488	503	450	429	457	498	519	513	506	515
25-29	271	373	399	422	439	378	366	423	507	521	469	448	475	516	537	532	524
30-34	233	296	385	409	432	449	389	378	434	517	532	480	459	486	527	548	543
35-39	231	246	302	390	413	437	454	394	383	439	522	537	485	464	491	532	553
40-44	237	237	248	303	390	414	437	454	395	384	440	523	537	486	465	493	533
45-49	233	238	237	247	302	388	412	435	452	393	383	438	520	534	484	463	491
50-54	189	235	236	234	245	298	384	407	430	447	389	379	433	515	529	479	459
55-59	170	184	231	231	230	240	293	376	399	422	438	382	372	426	505	519	471
60-64	141	168	179	223	223	222	233	283	364	386	408	424	370	361	413	490	504
20-64	2038	2356	2622	2880	3034	3174	3372	3638	3867	3959	4010	4068	4149	4307	4464	4562	4593
65-69	119	135	158	169	210	211	211	221	269	345	367	388	404	354	346	396	470
70-74	96	107	120	142	152	190	191	191	201	246	316	336	357	372	327	320	367
75-79	71	80	89	101	119	128	160	162	162	171	211	271	290	308	323	284	278
80-84	45	51	59	66	75	89	97	122	124	125	133	165	214	229	245	258	228
85-89	22	27	31	36	41	47	57	62	79	81	83	89	112	146	159	171	182
90 +	9	12	14	17	20	24	28	35	40	51	56	59	65	80	105	123	137
65-90 +	362	412	471	531	617	689	744	793	875	1019	1166	1308	1442	1489	1505	1552	1662
Total	3844	4219	4545	4929	5310	5624	5900	6184	6489	6794	7077	7326	7558	7779	7994	8196	8388

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

Projected Total Population, Males and Females Combined, by Age Group, Canada, Canada Less Quebec, Ontario,
as of July 1, 1970-2050

Appendix A-7

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
	(Thousands)																
Canada																	
0-19	8650	8429	8273	8572	9347	9920	9984	9687	9546	9859	10284	10503	10513	10517	10660	10907	11126
20-64	11334	12886	14362	15761	16594	17253	18228	19628	20796	21248	21338	21418	21705	22427	23190	23563	23542
65-90+	1717	1944	2237	2508	2860	3156	3384	3583	3973	4623	5358	6101	6712	6853	6771	6923	7458
Total	21701	23259	24872	26841	28801	30329	31596	32898	34315	35730	36980	38022	38930	39797	40621	41393	42126
Canada less Quebec																	
0-19	6171	6163	6170	6456	7045	7466	7549	7408	7377	7644	7968	8142	8194	8258	8418	8631	8818
20-64	8093	9331	10463	11570	12292	12932	13772	14889	15840	16274	16462	16656	16977	17574	18164	18509	18601
65-90+	1310	1472	1681	1882	2145	2359	2527	2678	2963	3464	4019	4584	5066	5223	5243	5405	5817
Total	15574	16966	18314	19908	21482	22757	23848	24975	26180	27382	28449	29382	30237	31055	31825	32545	33236
Ontario																	
0-19	2952	2973	2977	3112	3405	3616	3663	3600	3589	3730	3904	4006	4041	4074	4160	4278	4382
20-64	4107	4743	5275	5800	6115	6396	6786	7316	7772	7971	8080	8201	8371	8689	9001	9195	9259
65-90+	634	716	720	915	1060	1184	1278	1362	1508	1758	2012	2259	2484	2550	2562	2648	2857
Total	7693	8432	8972	9827	10580	11196	11727	12278	12869	13459	13996	14466	14896	15313	15723	16121	16498

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and immigration assumptions.

APPENDIX B - DEPENDENCY RATIOS

(Unless otherwise stated ratios use the Royal Commission's population projections based on its most probable fertility and immigration assumptions)

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	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
	(Per cent)					
1975	13.2	17.0	15.1	66.5	64.3	65.4
1980	13.4	17.7	15.6	58.6	56.6	57.6
1990	14.4	20.2	17.2	57.4	55.3	56.3
2000	15.4	21.8	18.5	55.9	53.7	54.8
2010	15.9	22.3	19.1	46.9	44.9	45.9
2020	21.0	29.3	25.1	49.1	47.3	48.2
2030	25.8	36.2	30.9	49.3	47.6	48.4
2040	23.8	34.7	29.2	46.8	45.1	46.0
2050	26.2	37.2	31.7	48.1	46.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
	(Per cent)					
1975	13.9	17.7	15.8	66.9	65.1	66.0
1980	13.9	18.2	16.1	59.8	58.1	59.0
1990	14.6	20.3	17.5	58.2	56.4	57.3
2000	15.3	21.4	18.3	54.9	53.7	54.8
2010	15.8	21.7	18.7	47.6	45.5	46.6
2020	20.5	28.3	24.4	49.4	47.4	48.4
2030	24.9	34.8	29.8	49.2	47.3	48.2
2040	23.6	34.2	28.9	47.2	45.5	46.3
2050	25.9	36.7	31.3	48.3	46.5	47.4

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

	Ages 65+ to Ages 20-64			Ages 0-19 to Ages 20-64		
	Males	Females	Combined	Males	Females	Combined
	(Per cent)					
1975	12.7	17.5	15.1	63.8	61.6	62.7
1980	13.2	18.0	15.5	57.5	55.4	56.4
1990	14.4	20.3	17.3	56.7	54.7	55.7
2000	15.6	22.1	18.8	55.0	52.9	54.0
2010	16.2	22.6	19.4	47.2	45.2	46.2
2020	20.8	29.1	24.9	49.2	47.4	48.3
2030	24.7	34.8	29.7	49.1	47.4	48.3
2040	23.3	33.9	28.5	46.6	45.4	46.2
2050	25.6	36.2	30.9	48.2	46.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's population projections, based on its most probable fertility and immigration assumptions.

	Ages 65+ to Ages 20-64				Ages 0-19 to Ages 20-64			
	Low/low		Most probable		Low/low		Most probable	
	Low	High	Low	High	Low	High	Low	High
	(Per cent)							
1975	15.8	15.8	15.8	15.8	66.0	66.0	66.0	66.0
1980	16.1	16.1	16.1	16.1	57.5	58.0	59.0	60.2
1990	17.5	17.5	17.5	17.5	49.3	52.2	57.3	64.2
2000	18.6	18.5	18.3	18.2	45.9	50.5	54.8	62.9
2010	19.7	19.5	18.7	17.8	41.4	45.9	46.6	49.3
2020	26.7	25.5	24.4	22.6	41.5	46.8	48.4	50.2
2030	34.2	31.7	29.8	27.2	42.2	47.9	48.2	49.5
2040	34.6	31.0	28.9	25.8	41.6	46.8	46.3	45.9
2050	35.5	31.7	31.3	29.8	41.8	47.2	47.4	47.3

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's four fertility assumptions for population projections.

APPENDIX C - CANADA PENSION PLAN PROJECTED CONTRIBUTIONS AND
EXPENDITURES

(Unless otherwise stated all tables are for Canada less Quebec and are based on the Royal Commission's most probable fertility and economic assumptions.)

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	Retirement		Disability		Survivors		Total	
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit(a)	Indexing cost
	(Per cent)							
1978	1.21	.17	.29	.02	.52	.05	2.12	.24
1980	1.44	.28	.29	.05	.59	.11	2.42	.44
1990	2.27	.74	.32	.12	.70	.37	3.39	1.23
2000	2.85	.99	.34	.13	.80	.51	4.10	1.63
2010	3.21	1.11	.38	.15	.81	.58	4.50	1.84
2020	4.43	1.47	.39	.15	.89	.66	5.81	2.28
2030	5.16	1.89	.34	.13	.94	.72	6.54	2.75
2040	4.63	1.99	.37	.12	.92	.74	6.03	2.85
2050	5.19	2.01	.38	.12	.92	.73	6.59	2.87

a Includes expenses.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Assumptions Economic: Fertility:	Most probable				Low		High	
	Most probable		Low/High		Most probable		Most probable	
	Most probable	Low/High	Low	High	Most probable	Most probable	Most probable	High
	(Per cent)							
1978	2.36	2.36	2.36	2.36	2.34		2.37	
1980	2.86	2.86	2.86	2.86	2.85		2.89	
1990	4.61	4.60	4.60	4.62	4.68		4.34	
2000	5.73	5.82	5.79	5.65	5.78		5.59	
2010	6.34	6.79	6.62	5.99	6.38		6.26	
2020	8.08	8.87	8.45	7.48	8.11		8.02	
2030	9.28	10.63	9.82	8.49	9.32		9.21	
2040	8.87	10.50	9.42	8.06	8.92		8.79	
2050	9.45	10.60	9.50	9.13	9.52		9.34	

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Relationship of Canada Pension Plan Expenditures as a
Percentage of Contributory Earnings for Various Economic
and Fertility Assumptions to Most Probable Economic and
Fertility Assumptions, Canada Less Quebec, 1978-2050

Appendix C-3

	<u>Assumptions</u>				
	Economic:			Fertility:	
	Most probable			Most probable	
	<u>Low/Low</u>	<u>Low</u>	<u>High</u>	<u>Most probable</u>	<u>High</u>
1978	1.000	1.000	1.000	.992	1.004
1980	1.000	1.000	1.000	.997	1.010
1990	.998	.998	1.002	1.015	.941
2000	1.016	1.010	.986	1.009	.976
2010	1.071	1.044	.945	1.006	.987
2020	1.098	1.046	.926	1.004	.993
2030	1.145	1.058	.915	1.004	.992
2040	1.184	1.062	.909	1.006	.991
2050	1.122	1.005	.966	1.007	.988

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario.

Canada Pension Plan Expenditures as A Percentage of Contributory Earnings,
Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors		Expenses	Total expenditures
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost		
	(Per cent)							
1978	1.21	.17	.29	.02	.52	.05	.10	2.36
1979	1.34	.23	.29	.04	.55	.08	.10	2.62
1980	1.44	.28	.29	.05	.59	.11	.10	2.86
1981	1.48	.33	.29	.06	.61	.14	.10	3.01
1982	1.52	.37	.29	.07	.64	.17	.10	3.16
1983	1.56	.42	.29	.08	.64	.19	.10	3.28
1984	1.62	.46	.30	.08	.63	.22	.10	3.41
1985	1.69	.51	.30	.09	.64	.24	.10	3.56
1986	1.80	.56	.31	.10	.65	.27	.10	3.78
1987	1.92	.61	.31	.10	.66	.29	.10	3.99
1988	2.04	.66	.31	.11	.67	.32	.10	4.21
1989	2.16	.70	.32	.11	.69	.34	.10	4.42
1990	2.27	.74	.32	.12	.70	.37	.10	4.61
1991	2.37	.78	.32	.12	.71	.38	.10	4.78
1992	2.47	.81	.33	.12	.72	.40	.10	4.94
1993	2.55	.84	.33	.12	.73	.42	.10	5.09
1994	2.63	.86	.33	.12	.75	.43	.10	5.22
1995	2.69	.89	.33	.13	.76	.45	.10	5.34
1996	2.74	.91	.33	.13	.77	.46	.10	5.44
1997	2.77	.93	.33	.13	.78	.48	.10	5.53
1998	2.80	.95	.33	.13	.79	.49	.10	5.60
1999	2.83	.97	.34	.13	.80	.50	.10	5.67
2000	2.85	.99	.34	.13	.80	.51	.10	5.73

	Retirement		Disability		Survivors		Total
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	
	(Per cent)						Expenditures
2001	2.85	1.00	.34	.13	.80	.52	.10
2002	2.85	1.01	.34	.14	.80	.53	.10
2003	2.86	1.02	.35	.14	.80	.54	.10
2004	2.88	1.03	.35	.14	.80	.54	.10
2005	2.91	1.04	.36	.14	.80	.55	.10
2006	2.94	1.05	.36	.14	.80	.56	.10
2007	2.99	1.06	.37	.14	.80	.56	.10
2008	3.05	1.08	.37	.15	.81	.57	.10
2009	3.12	1.09	.37	.15	.81	.58	.10
2010	3.21	1.11	.38	.15	.81	.58	.10
2011	3.32	1.13	.38	.15	.82	.59	.10
2012	3.44	1.16	.38	.15	.83	.60	.10
2013	3.57	1.19	.38	.15	.83	.60	.10
2014	3.69	1.22	.38	.15	.84	.61	.10
2015	3.82	1.25	.38	.15	.85	.62	.10
2016	3.95	1.29	.39	.15	.86	.63	.10
2017	4.08	1.33	.39	.15	.87	.63	.10
2018	4.20	1.38	.39	.15	.87	.64	.10
2019	4.32	1.42	.39	.15	.88	.65	.10
2020	4.43	1.47	.39	.15	.89	.66	.10
2021	4.54	1.51	.38	.15	.90	.66	.10
2022	4.65	1.56	.38	.14	.91	.67	.10
2023	4.75	1.61	.38	.14	.91	.68	.10
2024	4.83	1.65	.37	.14	.92	.68	.10
2025	4.91	1.70	.37	.14	.92	.69	.10

Canada Pension Plan Expenditures as A Percentage of Contributory Earnings,
Canada Less Quebec, 1978-2050

	Retirement		Disability		Survivors		Total
	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	
	(Per cent)						Expenditures
2026	5.00	1.74	.36	.14	.93	.69	.10
2027	5.07	1.79	.36	.13	.93	.70	.10
2028	5.12	1.83	.35	.13	.94	.71	.10
2029	5.15	1.86	.35	.13	.94	.71	.10
2030	5.16	1.89	.34	.13	.94	.72	.10
2031	5.12	1.92	.34	.12	.94	.72	.10
2032	5.08	1.95	.34	.12	.94	.72	.10
2033	5.03	1.96	.34	.12	.94	.73	.10
2034	4.97	1.98	.34	.12	.94	.73	.10
2035	4.91	1.99	.34	.12	.94	.73	.10
2036	4.83	1.99	.35	.12	.93	.73	.10
2037	4.76	1.99	.35	.12	.93	.73	.10
2038	4.71	1.99	.35	.12	.93	.74	.10
2039	4.66	1.99	.36	.12	.93	.74	.10
2040	4.63	1.99	.37	.12	.92	.74	.10
2041	4.62	1.98	.37	.13	.92	.74	.10
2042	4.62	1.97	.38	.13	.92	.74	.10
2043	4.64	1.97	.38	.13	.92	.74	.10
2044	4.67	1.97	.39	.13	.92	.74	.10
2045	4.72	1.97	.39	.13	.92	.74	.10
2046	4.79	1.97	.39	.13	.92	.73	.10
2047	4.87	1.98	.39	.13	.92	.73	.10
2048	4.97	1.99	.39	.12	.92	.73	.10
2049	5.07	2.00	.38	.12	.92	.73	.10
2050	5.19	2.01	.38	.12	.92	.73	.10

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Expenditures								
	Contributory earnings	Retirement		Disability		Survivors		Expenses	Total
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost		
(Millions of dollars)									
1978	57,974	702	98	167	11	300	30	58	1,366
1980	74,469	1,074	208	216	37	438	82	74	2,129
1990	192,947	4,380	1,431	618	223	1,349	704	193	8,898
2000	390,953	11,143	3,865	1,324	523	3,141	1,998	391	22,385
2010	800,007	25,665	8,886	3,012	1,179	6,509	4,665	800	50,716
2020	1,498,757	66,428	21,958	5,776	2,199	13,339	9,828	1,499	121,027
2030	2,815,444	145,190	53,329	9,652	3,533	26,465	20,152	2,815	261,136
2040	5,393,909	249,791	107,145	19,834	6,712	49,855	39,776	5,394	478,507
2050	10,001,958	519,088	201,452	38,095	12,039	91,932	72,857	10,002	945,465

a Figures are rounded.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Contributory Earnings and Expenditures in Millions of Dollars,
Canada Less Quebec, 1978-2050

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	Contributory earnings	Expenditures								Total
		Retirement		Disability		Survivors				
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses		
									(Millions of dollars)	
1978	57,974.3	702.7	97.7	166.7	11.2	300.1	29.7	58.0	1,366.1	
1979	65,836.8	880.9	148.2	189.8	24.6	364.5	52.7	65.8	1,726.6	
1980	74,468.7	1,073.6	208.1	215.8	37.2	438.0	81.6	74.5	2,128.7	
1981	84,300.7	1,246.7	276.1	244.2	49.8	518.4	117.4	84.3	2,537.0	
1982	94,824.2	1,438.6	354.4	275.7	63.7	610.6	161.6	94.8	2,999.5	
1983	105,947.6	1,655.3	443.7	310.9	79.5	675.3	205.0	105.9	3,475.7	
1984	117,579.7	1,902.9	544.7	349.7	97.1	746.1	254.5	117.6	4,012.6	
1985	129,629.6	2,187.5	657.9	389.9	115.5	823.8	310.5	129.6	4,614.7	
1986	141,379.4	2,550.0	789.9	433.2	134.6	913.3	376.7	141.4	5,339.0	
1987	153,520.8	2,953.1	934.1	476.2	154.0	1,010.6	449.4	153.5	6,130.9	
1988	166,119.1	3,394.1	1,089.5	522.0	175.6	1,115.7	528.6	166.1	6,991.6	
1989	179,239.3	3,870.7	1,255.3	568.6	198.8	1,228.4	613.9	179.2	7,914.9	
1990	192,947.2	4,380.1	1,430.7	617.8	222.8	1,348.7	704.7	192.9	8,897.8	
1991	206,850.1	4,906.4	1,604.1	669.4	244.9	1,470.6	794.4	206.9	9,896.6	
1992	221,585.5	5,463.8	1,788.1	724.7	266.5	1,601.4	889.9	221.6	10,955.9	
1993	237,332.0	6,053.1	1,984.5	781.8	290.0	1,742.6	992.8	237.3	12,082.2	
1994	254,269.5	6,675.3	2,195.3	843.0	316.0	1,895.7	1,104.0	254.3	13,283.6	
1995	272,577.7	7,331.1	2,422.3	906.3	343.7	2,061.9	1,224.6	272.6	14,562.5	
1996	292,616.4	8,005.3	2,670.8	975.1	373.8	2,250.6	1,356.1	292.6	15,924.3	
1997	314,339.4	8,718.7	2,938.4	1,048.9	406.1	2,453.3	1,498.5	314.3	17,378.2	
1998	337,880.4	9,476.3	3,226.0	1,129.4	441.0	2,669.7	1,652.6	337.9	18,932.7	
1999	363,373.4	10,282.7	3,534.6	1,221.6	480.0	2,899.1	1,819.0	363.4	20,600.5	
2000	390,952.9	11,143.0	3,865.2	1,324.2	522.7	3,141.1	1,998.4	391.0	22,385.6	

	Expenditures									
	Contributory earnings	Retirement		Disability		Survivors				
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Expenses	Total	
(Millions of dollars)										
2001	421,103.3	12,000.9	4,209.8	1,435.6	568.4	3,383.2	2,191.8	421.1	24,210.9	
2002	453,520.6	12,937.5	4,580.7	1,561.8	619.2	3,639.8	2,399.5	453.5	26,192.0	
2003	488,250.4	13,972.7	4,981.1	1,698.7	673.7	3,913.4	2,622.3	488.2	28,350.2	
2004	525,339.5	15,126.6	5,414.4	1,850.2	733.2	4,206.3	2,860.8	525.3	30,716.9	
2005	564,834.5	16,419.2	5,883.7	2,016.3	797.8	4,521.1	3,115.8	564.8	33,318.8	
2006	608,819.0	17,848.1	6,375.6	2,197.0	867.4	4,862.6	3,385.9	606.8	36,143.5	
2007	651,292.2	19,461.4	6,914.3	2,382.6	938.9	5,230.3	3,674.5	651.3	39,253.3	
2008	698,289.8	21,284.9	7,507.2	2,578.1	1,013.8	5,626.1	3,982.9	698.3	42,691.3	
2009	747,848.9	23,344.2	8,162.0	2,781.6	1,091.6	6,051.8	4,312.5	747.8	46,491.6	
2010	800,007.2	25,664.9	8,886.0	3,012.6	1,178.7	6,509.5	4,664.8	800.0	50,716.4	
2011	853,957.5	28,352.0	9,674.4	3,258.7	1,271.5	6,998.1	5,039.5	854.0	55,448.2	
2012	910,790.2	31,332.1	10,550.0	3,465.5	1,350.0	7,523.1	5,440.5	910.8	60,572.0	
2013	970,749.9	34,611.1	11,523.4	3,697.5	1,437.3	8,086.9	5,869.7	970.7	66,196.7	
2014	1,034,084.6	38,195.0	12,605.1	3,955.5	1,533.4	8,692.3	6,329.1	1,034.1	72,344.3	
2015	1,101,040.0	42,089.6	13,805.6	4,232.2	1,635.8	9,341.7	6,820.7	1,101.0	79,026.4	
2016	1,171,110.0	46,263.4	15,133.0	4,523.2	1,743.0	10,035.1	7,340.5	1,171.1	86,208.7	
2017	1,245,482.0	50,769.1	16,600.9	4,832.2	1,856.1	10,778.4	7,897.8	1,245.5	93,979.4	
2018	1,324,591.0	55,621.7	18,220.5	5,145.8	1,970.5	11,574.7	8,495.9	1,324.6	102,353.1	
2019	1,408,871.0	60,836.3	20,002.6	5,462.4	2,085.5	12,427.3	9,138.1	1,408.9	111,360.5	
2020	1,498,757.0	66,428.2	21,958.4	5,776.3	2,199.2	13,339.3	9,827.8	1,498.8	121,027.4	
2021	1,594,231.0	72,452.0	24,105.1	6,105.9	2,317.4	14,313.1	10,563.6	1,594.2	131,450.8	
2022	1,696,292.0	78,873.5	26,446.1	6,461.3	2,443.8	15,352.9	11,354.2	1,696.3	142,627.4	
2023	1,805,487.0	85,697.9	28,991.2	6,822.9	2,571.7	16,462.3	12,203.8	1,805.5	154,554.8	
2024	1,922,357.0	92,930.4	31,750.1	7,197.1	2,703.2	17,644.7	13,116.5	1,922.4	167,263.9	
2025	2,047,458.0	100,576.4	34,732.3	7,571.5	2,834.0	18,903.5	14,096.6	2,047.5	180,761.2	

	Expenditures								
	Contributory earnings	Retirement		Disability		Survivors		Total	
		Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost	Non-indexed benefit	Indexing cost		
(Millions of dollars)									
2026	2,180,265.0	108,940.6	37,987.9	7,952.6	2,965.2	20,239.8	15,147.1	2,180.3	195,412.9
2027	2,322,658.0	117,653.7	41,476.1	8,352.8	3,101.1	21,660.0	16,273.4	2,322.7	210,839.2
2028	2,475,446.0	126,646.2	45,195.9	8,751.3	3,235.0	23,168.3	17,479.9	2,475.4	226,951.6
2029	2,639,434.0	135,848.1	49,147.1	9,179.2	3,377.3	24,768.7	18,771.2	2,639.4	243,730.4
2030	2,815,444.0	145,190.1	53,328.9	9,651.6	3,533.1	26,465.3	20,151.7	2,815.4	261,135.6
2031	3,004,941.0	153,999.2	57,758.9	10,228.0	3,721.1	28,254.3	21,628.9	3,004.9	278,594.9
2032	3,207,911.0	162,959.5	62,414.4	10,890.9	3,935.3	30,149.6	23,203.7	3,207.9	296,760.8
2033	3,424,996.0	172,151.8	67,289.5	11,670.3	4,185.0	32,157.1	24,879.7	3,425.0	315,757.9
2034	3,656,842.0	181,656.9	72,379.6	12,526.8	4,456.9	34,282.8	26,660.9	3,656.8	335,620.2
2035	3,904,093.0	191,556.0	77,679.3	13,434.0	4,742.2	36,532.7	28,551.0	3,904.1	356,398.8
2036	4,167,099.0	201,342.0	83,056.5	14,430.3	5,053.5	38,897.4	30,556.3	4,167.1	377,502.5
2037	4,446,869.0	211,830.7	88,665.0	15,551.6	5,401.4	41,402.1	32,678.2	4,446.9	399,975.4
2038	4,744,119.0	223,249.9	94,531.6	16,835.3	5,797.2	44,056.8	34,919.8	4,744.1	424,134.4
2039	5,059,557.0	235,827.4	100,682.6	18,277.3	6,238.7	46,871.3	37,284.7	5,059.6	450,241.2
2040	5,393,909.0	249,791.1	107,145.1	19,834.3	6,711.9	49,855.4	39,776.1	5,393.9	478,507.4
2041	5,745,717.0	265,262.7	113,731.4	21,462.6	7,203.2	52,995.4	42,383.7	5,745.7	508,784.4
2042	6,118,406.0	282,602.7	120,735.9	23,163.1	7,712.5	56,330.7	45,128.2	6,118.4	541,791.2
2043	6,513,227.0	302,065.1	128,238.8	24,934.2	8,238.9	59,876.9	48,017.2	6,513.2	577,884.1
2044	6,931,429.0	323,904.3	136,320.2	26,763.5	8,778.9	63,650.0	51,057.1	6,931.4	617,405.1
2045	7,374,276.0	348,374.7	145,061.1	28,635.4	9,327.6	67,665.6	54,255.2	7,374.3	660,693.6
2046	7,843,007.0	375,729.8	154,539.6	30,533.5	9,880.1	71,939.2	57,618.2	7,843.0	708,083.3
2047	8,338,885.0	406,224.6	164,838.4	32,446.5	10,432.8	76,487.2	61,153.1	8,338.9	759,921.3
2048	8,863,170.0	440,112.7	176,037.2	34,361.0	10,981.6	81,324.6	64,866.9	8,863.2	816,546.8
2049	9,417,106.0	477,649.0	188,214.8	36,252.7	11,519.5	86,467.7	68,765.8	9,417.1	878,286.4
2050	10,001,958.0	519,088.1	201,452.5	38,094.9	12,038.8	91,932.2	72,857.1	10,002.0	945,465.2

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan Comparison of Expenditures in Millions of Dollars and as a Percentage of
Contributory Earnings, Based on Most Probable Fertility Assumptions, Together with Most Probable
and High Economic Assumptions, Canada Less Quebec, 1978-2050

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	Expenditures in millions of dollars				Percentage of contributory earnings					
	Contributory earnings		Total expenditures		Non-indexed benefit		Indexing cost		Total	
	Most probable	High	economic	Most probable	High	economic	Most probable	High	economic	Most probable
1978	57,974	58,370	1,366	1,382	2.12	2.10	.24	.27	2.36	2.37
1979	65,837	66,746	1,727	1,765	2.27	2.25	.35	.39	2.62	2.64
1980	74,469	76,169	2,129	2,200	2.42	2.37	.44	.52	2.86	2.89
1981	84,301	86,598	2,537	2,642	2.48	2.41	.53	.64	3.01	3.05
1982	94,824	98,234	3,000	3,156	2.55	2.45	.61	.76	3.16	3.21
1983	105,948	111,169	3,476	3,704	2.60	2.47	.68	.86	3.28	3.33
1984	117,580	125,496	4,013	4,338	2.65	2.50	.76	.96	3.41	3.46
1985	129,630	141,308	4,615	5,068	2.72	2.54	.84	1.05	3.56	3.59
1986	141,379	159,379	5,339	5,946	2.85	2.58	.92	1.15	3.77	3.73
1987	153,521	178,951	6,131	6,937	2.99	2.66	1.00	1.22	3.99	3.88
1988	166,119	199,946	6,992	8,052	3.12	2.73	1.08	1.30	4.20	4.03
1989	179,239	222,286	7,915	9,294	3.26	2.80	1.15	1.38	4.41	4.18
1990	192,947	245,893	8,898	10,665	3.38	2.89	1.22	1.45	4.60	4.34
1995	272,578	380,229	14,562	19,566	3.88	3.37	1.46	1.78	5.34	5.15
2000	390,953	598,414	22,386	33,445	4.10	3.56	1.63	2.03	5.73	5.59
2010	800,007	1,478,324	50,716	92,592	4.50	3.91	1.84	2.35	6.34	6.26
2020	1,498,757	3,336,034	121,027	267,548	5.80	5.15	2.28	2.87	8.08	8.02
2030	2,815,444	7,556,474	261,136	696,154	6.54	5.65	2.74	3.56	9.28	9.21
2040	5,393,909	17,448,048	478,507	1,533,701	6.02	5.11	2.85	3.68	8.87	8.79
2050	10,001,958	38,995,264	945,465	3,641,725	6.59	5.64	2.86	3.70	9.45	9.34

Expenses are "non-indexed."

Source Data prepared for Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan Comparison of Expenditures in Millions of Dollars and as a Percentage of
Contributory Earnings, Based on Most Probable Economic Assumptions, Together with Most Probable
and Low-Low Fertility Assumptions, Canada Less Quebec, 1978-2050

	Expenditures in millions of dollars				Percentage of contributory Earnings					
	Contributory earnings		Total expenditures		Non-indexed benefit		Indexing cost		Total	
	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility	Most probable	Low-Low fertility
1978	57,974	57,974	1,366	1,366	2.12	2.12	.24	.24	2.36	2.36
1979	65,837	65,837	1,727	1,727	2.27	2.27	.35	.35	2.62	2.62
1980	74,469	74,467	2,129	2,129	2.42	2.42	.44	.44	2.86	2.86
1981	84,301	84,301	2,537	2,537	2.48	2.48	.53	.53	3.01	3.01
1982	94,824	94,824	3,000	3,000	2.55	2.55	.61	.61	3.16	3.16
1983	105,948	105,948	3,476	3,476	2.60	2.60	.68	.68	3.28	3.28
1984	117,580	117,580	4,013	4,013	2.65	2.65	.76	.76	3.41	3.41
1985	129,630	129,630	4,615	4,615	2.72	2.72	.84	.84	3.56	3.56
1986	141,379	141,379	5,339	5,339	2.85	2.85	.92	.92	3.77	3.77
1987	153,521	153,521	6,131	6,131	2.99	2.99	1.00	1.00	3.99	3.99
1988	166,119	166,119	6,992	6,992	3.12	3.12	1.08	1.08	4.20	4.20
1989	179,239	179,239	7,915	7,915	3.26	3.26	1.15	1.15	4.41	4.41
1990	192,947	192,934	8,898	8,898	3.38	3.38	1.22	1.22	4.60	4.60
1995	272,578	271,610	14,562	14,500	3.88	3.88	1.46	1.46	5.34	5.34
2000	390,953	383,127	22,386	22,288	4.10	4.17	1.63	1.65	5.73	5.82
2010	800,007	743,442	50,716	50,510	4.50	4.82	1.84	1.97	6.34	6.79
2020	1,498,757	1,355,978	121,027	120,290	5.80	6.38	2.28	2.49	8.08	8.87
2030	2,815,444	2,434,323	261,136	258,681	6.54	7.49	2.74	3.14	9.28	10.63
2040	5,393,909	4,471,399	478,507	469,326	6.02	7.12	2.85	3.38	8.87	10.50
2050	10,001,958	8,116,311	945,465	860,635	6.59	7.25	2.86	3.35	9.45	10.60

Expenses are "non-indexed."

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Comparison of Population,
Expenditures, Fund Size, Unfunded Actuarial
Liability, and Pay-go Contributions, Canada
Less Quebec, and Ontario, 1975-2050

Appendix C-9

	Canada less Quebec	Ontario	Ratio of Ontario to Canada less Quebec
	(Thousands)		
Male population			
1975	8,517	4,213	.49
2000	11,861	5,827	.49
2025	14,498	7,140	.49
2050	16,321	8,110	.50
Female population			
1975	8,449	4,219	.50
2000	11,987	5,900	.49
2025	14,884	7,326	.49
2050	16,915	8,388	.50
Projected expenditures	(Billions of dollars)		
1978	1.4	.7	.50
2000	22.4	11.9	.53
2025	180.8	91.0	.50
2050	945.5	472.8	.50
Initial fund, Dec. 31, 1977	12.6	6.9	.55
Dec. 31, 1977 unfunded actuarial liability (entry age normal)	98.5	47.5	.48
Pay-go contributions	(Percentage of expenditures)		
1978	2.36	2.41	1.02
2000	5.73	6.07	1.06
2025	8.83	8.89	1.01
2050	9.45	9.35	.99

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable economic and fertility assumptions.

Canada Pension Plan, Comparison of Entry Age Normal
Costs and Allocation of Initial Assets, Canada Less
Quebec, Ontario

Appendix C-10

Entry age normal costs(a)	Canada less Quebec	Ontario	
		Canadian investment rate of return (Per cent)	Ontario investment rate of return
Retirement			
Non-indexed benefit	5.06	5.08	4.49
Indexing cost	2.09	2.10	1.81
Total	7.15	7.17	6.30
Welfare - Non-indexed benefit			
Disability	.38	.38	.36
Survivor	1.05	1.04	.93
Total	1.43	1.42	1.29
Welfare - Indexing cost			
Disability	.14	.14	.13
Survivor	.84	.82	.72
Total	.98	.97	.85
Total			
Non-indexed benefit	6.49	6.50	5.78
Indexing cost	3.07	3.07	2.66
Total	9.56	9.57	8.45
Initial funds	(Billions of dollars)		
Retirement	9.7	5.3	5.3
Welfare	2.9	1.6	1.6
Total	12.6	6.9	6.9

a Excludes expenses which equal .1 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable economic and fertility assumptions.

Canada Pension Plan, Comparison of Unfunded Liabilities and Fifty-year Liquidation
Percentage, (a) Canada Less Quebec and Ontario

Appendix C-11

	Ontario			
	Canada less Quebec		Ontario	
	(Billions of dollars)	(Per cent)	Canadian investment rate of return (Billions of dollars) (Per cent)	Ontario investment rate of return (Billions of dollars) (Per cent)
Retirement				
Non-indexed	47.3	1.38	24.7	23.0
Indexed	23.7	.69	12.4	11.4
Total	71.0	2.07	37.0	34.4
Welfare				
Non-indexed	15.2	.44	7.9	7.3
Indexed	12.4	.36	6.3	5.8
Total	27.5	.80	14.2	13.1
Total				
Non-indexed	62.5	1.82	32.6	30.3
Indexed	36.1	1.05	18.7	17.2
Total	98.5	2.87	51.2	47.5

a Contribution rate as percentage of contributory earnings required to liquidate unfunded liability over fifty-year period 1980-2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX D - CANADA PENSION PLAN FUND ANALYSIS

(Unless otherwise stated the basis for the Table is Canada less Quebec and the Royal Commission's most probable fertility and economic assumptions)

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	Contribution Rate			Fund as multiple of benefits		
	Pay-go	Fund A	Fund B	Fund C	Fund A	Fund B
		(Percent)			Fund C	
1978	2.36	3.60	3.60	3.60	10.5	10.5
1980	2.86	3.60	3.60	3.60	8.5	8.5
1990	4.61	3.60	4.61	3.60	4.0	4.0
2000	5.73	3.60	5.73	5.07	.3	1.6
2010	6.34	(a)	6.34	6.05	(b)	.7
2020	8.08		8.08	7.92	-	.3
2030	9.28		9.28	9.19	-	.1
2040	8.87		8.87	8.83	-	.1
2050	9.45		9.45	9.43	-	0

a Fund A would be exhausted in year 2001 and thereafter contributions would be at the pay-go rate unless other revenue were found.

b Under Fund A, the cash flow becomes negative in 1986. Interest is first required from the provinces and the fund reaches its maximum in 1992.

Source Data prepared for the Royal Commission on the Status of Persons in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Contribution Rates and Fund as a Multiple
of Benefits for Funds D, E, and F, Canada Less Quebec, 1978 - 2050

Appendix D-2

	Pay-go	Contribution Rate				Fund as multiple of benefits			
		Fund D	Fund E	Fund F	(Percent)	Fund D	Fund E	Fund F	
1978	2.36	3.60	3.60	3.60	3.60	10.5	10.5	10.5	
1980	2.86	12.53	9.48	6.98	6.98	11.7	10.6	9.7	
1990	4.61	12.53	10.82	8.78	8.78	24.6	19.1	13.9	
2000	5.73	12.53	11.11	9.31	9.31	31.8	24.9	17.5	
2010	6.34	12.53	11.24	9.57	9.57	36.6	28.7	19.9	
2020	8.08	12.53	11.40	10.08	10.08	35.1	27.5	18.7	
2030	9.28	9.66	9.38	9.18	9.18	33.9	26.3	17.6	
2040	8.87	9.66	9.41	9.30	9.30	35.1	27.0	18.1	
2050	9.45	9.66	9.40	9.32	9.32	33.7	25.8	17.3	

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Benefits and expenses	Fund A 3.6% contribution rate					Fund B Cash flow not negative					Fund C Cash flow not greater than interest when negative				
	(\$M)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)	Contri- bution rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)	Contri- bution rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)
1978	1366	2087	721	1012	14.3	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3
1979	1727	2370	644	1163	16.1	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1
1980	2129	2681	552	1309	18.0	3.60	2681	552	1309	18.0	3.60	2681	552	1309	18.0
1981	2537	3035	498	1455	20.0	3.60	3035	498	1455	20.0	3.60	3035	498	1455	20.0
1982	2999	3414	414	1608	22.0	3.60	3414	414	1608	22.0	3.60	3414	414	1608	22.0
1983	3476	3814	338	1766	24.1	3.60	3814	338	1766	24.1	3.60	3814	338	1766	24.1
1984	4013	4233	220	1930	26.2	3.60	4233	220	1930	26.2	3.60	4233	220	1930	26.2
1985	4615	4667	52	2095	28.4	3.60	4667	52	2095	28.4	3.60	4667	52	2095	28.4
1986	5339	5090	-248	2255	30.4	3.78	5339	0	2260	30.6	3.60	5090	-248	2255	30.4
1987	6131	5527	-603	2411	32.2	3.99	6131	0	2442	33.1	3.60	5527	-603	2411	32.2
1988	6992	5980	-1010	2554	33.7	4.21	6992	0	2641	35.7	3.60	5980	-1010	2554	33.7
1989	7915	6453	-1461	2668	34.9	4.42	7915	0	2847	38.6	3.60	6453	-1461	2668	34.9
1990	8898	6946	-1951	2745	35.7	4.61	8898	0	3052	41.6	3.60	6946	-1951	2745	35.7
1991	9897	7447	-2449	2776	36.1	4.78	9897	0	3235	44.9	3.60	7447	-2449	2776	36.1
1992	10956	7977	-2978	2782	35.9	4.94	10956	0	3435	48.3	3.67	8133	-2822	2823	36.1
1993	12082	8544	-3537	2751	35.1	5.09	12082	0	3645	51.9	3.91	9271	-2811	2812	36.1
1994	13284	9154	-4129	2676	33.6	5.22	13284	0	3864	55.8	4.13	10498	-2785	2786	36.1
1995	14562	9813	-4749	2545	31.4	5.34	14562	0	4083	59.9	4.33	11811	-2750	2751	36.1
1996	15924	10534	-5389	2358	28.4	5.44	15924	0	4309	64.2	4.52	13213	-2710	2711	36.1
1997	17378	11316	-6061	2107	24.4	5.53	17378	0	4544	68.7	4.68	14710	-2668	2669	36.1
1998	18933	12164	-6768	1774	19.4	5.60	18933	0	4792	73.5	4.83	16308	-2624	2625	36.1
1999	20600	13081	-7518	1366	13.3	5.67	20600	0	5057	78.6	4.96	18009	-2590	2591	36.1
2000	22386	14074	-8310	862	5.8	5.73	22386	0	5348	83.9	5.07	19822	-2563	2564	36.1

Fund A										Fund B				Fund C			
3.6% contribution rate										Cash flow not negative				Cash flow not greater than interest when negative			
Benefits and expenses		Contri- butions		Cash flow		Inter- est		Fund		Contri- bution rate		Contri- butions		Cash flow		Contri- bution rate	
(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$M)	(\$B)	(\$B)	(%)	(%)	(\$M)	(\$M)	(\$M)	(\$M)	(%)	(%)
2001	24211	15160	-9050	272	-3.0	5.75	24211	0	5663	89.6	5.15	21676	-2534	2535	36.1	5.15	21676
2002	26192	16327	-9864	-346	-13.2	5.78	26192	0	5996	95.6	5.22	23687	-2504	2505	36.1	5.22	23687
2003	28350	17577	-10772	-1014	-25.0	5.81	28350	0	6350	101.9	5.30	25876	-2473	2474	36.1	5.30	25876
2004	30717	18912	-11804	-1785	-38.5	5.85	30717	0	6725	108.7	5.38	28274	-2442	2443	36.1	5.38	28274
2005	33319	20334	-12984	-2673	-54.2	5.90	33319	0	7126	115.8	5.47	30902	-2416	2417	36.1	5.47	30902
2006	36143	21845	-14297	-3696	-72.2	5.96	36143	0	7555	123.3	5.56	33755	-2388	2389	36.1	5.56	33755
2007	39253	23447	-15806	-4872	-92.9	6.03	39253	0	8005	131.3	5.66	36895	-2357	2358	36.1	5.66	36895
2008	42691	25138	-17552	-6224	-116.7	6.11	42691	0	8479	139.8	5.78	40360	-2330	2331	36.1	5.78	40360
2009	46492	26923	-19568	-7778	-144.0	6.22	46492	0	8981	148.8	5.91	44184	-2307	2308	36.1	5.91	44184
2010	50716	28800	-21915	-9566	-175.5	6.34	50716	0	9524	158.3	6.05	48409	-2307	2308	36.1	6.05	48409
2011	55448	30742	-24705	-11625	-211.8	6.49	55448	0	10133	168.5	6.22	53141	-2307	2308	36.1	6.22	53141
2012	60572	32788	-27783	-14000	-253.6	6.65	60572	0	10782	179.2	6.40	58264	-2307	2308	36.1	6.40	58264
2013	66197	34947	-31249	-16729	-301.6	6.82	66197	0	11472	190.7	6.58	63889	-2307	2308	36.1	6.58	63889
2014	72344	37227	-35116	-19862	-356.6	7.00	72344	0	12206	202.9	6.77	70037	-2307	2308	36.1	6.77	70037
2015	79026	39637	-39388	-23449	-419.4	7.18	79026	0	12987	215.9	6.97	76719	-2307	2308	36.1	6.97	76719
2016	86209	42160	-44048	-27545	-491.0	7.36	86209	0	13818	229.7	7.16	83901	-2307	2308	36.1	7.16	83901
2017	93979	44837	-49141	-32209	-572.3	7.55	93979	0	14702	244.4	7.36	91672	-2307	2308	36.1	7.36	91672
2018	102353	47685	-54667	-37504	-644.5	7.73	102353	0	15643	260.1	7.55	100046	-2307	2308	36.1	7.55	100046
2019	111361	50719	-60640	-43498	-768.7	7.90	111361	0	16645	276.7	7.74	109053	-2307	2308	36.1	7.74	109053
2020	121027	53955	-67071	-50266	-866.0	8.08	121027	0	17710	294.4	7.92	118720	-2307	2308	36.1	7.92	118720
2021	131451	57392	-74058	-57888	-1017.9	8.25	131451	0	18843	313.3	8.10	129143	-2307	2308	36.1	8.10	129143
2022	142627	61067	-81560	-66452	-1166.0	8.41	142627	0	20050	333.3	8.27	140320	-2307	2308	36.1	8.27	140320
2023	154555	64998	-89556	-76053	-1331.6	8.56	154555	0	21333	354.7	8.43	152247	-2307	2308	36.1	8.43	152247
2024	167264	69205	-98058	-86788	-1516.4	8.70	167264	0	22698	377.4	8.58	164956	-2307	2308	36.1	8.58	164956
2025	180761	73708	-107052	-98762	-1722.2	8.83	180761	0	24150	401.5	8.72	178454	-2307	2308	36.1	8.72	178454

	Fund A					Fund B					Fund C				
	3.6% contribution rate					Cash flow not negative					Cash flow not greater than interest when negative				
	Benefits and expenses (\$M)	Contributions (\$M)	Cash flow (\$M)	Interest rate (\$M)	Fund (\$B)	Contributions rate (%)	Contributions (\$M)	Cash flow (\$M)	Interest rate (\$M)	Fund (\$B)	Contributions rate (%)	Contributions (\$M)	Cash flow (\$M)	Interest rate (\$M)	Fund (\$B)
2026	195413	78490	-116922	-112093	-1951.3	8.96	195413	0	25696	427.2	8.86	193105	-2307	2308	36.1
2027	210839	83616	-127223	-126914	-2205.4	9.08	210839	0	27341	454.5	8.98	208532	-2307	2308	36.1
2028	226952	89116	-137835	-143349	-2486.6	9.17	226952	0	29090	483.6	9.07	224644	-2307	2308	36.1
2029	243730	95020	-148710	-161519	-2796.8	9.23	243730	0	30952	514.6	9.15	241423	-2307	2308	36.1
2030	261136	101356	-159779	-181550	-3138.1	9.28	261136	0	32933	547.5	9.19	258828	-2307	2308	36.1
2031	278595	108178	-170416	-203567	-3512.1	9.27	278595	0	35041	582.6	9.19	276287	-2307	2308	36.1
2032	296761	115485	-181275	-227675	-3921.1	9.25	296761	0	37284	619.8	9.18	294453	-2307	2308	36.1
2033	315758	123300	-192457	-254026	-4367.6	9.22	315758	0	39670	659.5	9.15	313450	-2307	2308	36.1
2034	335620	131646	-203973	-282787	-4854.3	9.18	335620	0	42208	701.7	9.11	333313	-2307	2308	36.1
2035	356399	140547	-215851	-314128	-5384.3	9.13	356399	0	44910	746.6	9.07	354091	-2307	2308	36.1
2036	377503	150016	-227486	-348235	-5960.0	9.06	377503	0	47784	794.4	9.00	375195	-2307	2308	36.1
2037	399975	160087	-239887	-385279	-6585.2	8.99	399975	0	50842	845.3	8.94	397668	-2307	2308	36.1
2038	424134	170788	-253345	-425504	-7264.0	8.94	424134	0	54096	899.4	8.89	421827	-2307	2308	36.1
2039	450241	182144	-268096	-469187	-8001.3	8.90	450241	0	57558	956.9	8.85	447934	-2307	2308	36.1
2040	478507	194181	-284326	-516633	-8802.3	8.87	478507	0	61242	1018.2	8.83	476200	-2307	2308	36.1
2041	508784	206846	-301938	-568178	-9672.4	8.86	508784	0	65161	1083.3	8.81	506477	-2307	2308	36.1
2042	541791	220263	-321528	-624177	-10618.1	8.86	541791	0	69331	1152.6	8.82	539483	-2307	2308	36.1
2043	577884	234476	-343407	-685052	-11646.6	8.87	577884	0	73768	1226.4	8.84	575576	-2307	2308	36.1
2044	617405	249531	-367873	-751265	-12765.7	8.91	617405	0	78489	1304.9	8.87	615097	-2307	2308	36.1
2045	660694	265474	-395219	-823329	-13984.3	8.96	660694	0	83512	1388.4	8.93	658386	-2307	2308	36.1
2046	708083	282348	-425734	-901803	-15311.8	9.03	708083	0	88858	1477.3	9.00	705776	-2307	2308	36.1
2047	759921	300200	-459721	-987308	-16758.8	9.11	759921	0	94543	1571.8	9.09	757614	-2306	2307	36.1
2048	816547	319074	-497472	-1080514	-18336.8	9.21	816547	0	100596	1672.4	9.19	814240	-2306	2307	36.1
2049	878286	339016	-539270	-1182169	-20058.3	9.33	878286	0	107033	1779.4	9.30	875979	-2306	2307	36.1
2050	945465	360070	-585394	-1293083	-21936.7	9.45	945465	0	113884	1893.3	9.43	943157	-2307	2308	36.1

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Benefits and expenses	Fund D						Fund E						Fund F								
	Entry age normal funding						Entry age normal funding of retirement benefits, pay-go funding of balance						Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance								
	(\$M)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)					
1978	1366	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3	3.60	2087	721	1012	14.3
1979	1727	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1	3.60	2370	644	1163	16.1
1980	2129	12.53	9328	7199	1441	24.8	9.48	7058	4929	1396	22.5	6.98	5195	3066	1359	20.6	6.98	5195	3066	1359	20.6
1981	2537	12.53	10559	8022	2140	34.9	9.52	8023	5486	1907	29.9	7.06	5954	3417	1716	25.7	7.06	5954	3417	1716	25.7
1982	2999	12.53	11877	8878	2959	46.8	9.56	9062	6062	2502	38.4	7.15	6778	3779	2128	31.6	7.15	6778	3779	2128	31.6
1983	3476	12.53	13271	9795	3912	60.5	9.59	10157	6682	3191	48.3	7.22	7654	4178	2603	38.4	7.22	7654	4178	2603	38.4
1984	4013	12.53	14728	10715	5013	76.2	9.62	11308	7296	3983	59.6	7.30	8582	4570	3146	46.1	7.30	8582	4570	3146	46.1
1985	4615	12.53	16237	11622	6261	94.1	10.11	13101	8486	4887	72.9	7.83	10153	5538	3768	55.4	7.83	10153	5538	3768	55.4
1986	5339	12.53	17709	12370	7636	114.1	10.63	15032	9693	5929	88.6	8.41	11889	6550	4497	66.5	8.41	11889	6550	4497	66.5
1987	6131	12.53	19229	13098	9181	136.4	10.68	16396	10265	7138	106.0	8.51	13060	6929	5354	78.7	8.51	13060	6929	5354	78.7
1988	6992	12.53	20807	13816	10901	161.1	10.73	17822	10830	8484	125.3	8.60	14290	7299	6307	92.3	8.60	14290	7299	6307	92.3
1989	7915	12.53	22451	14536	12799	188.4	10.77	19312	11397	9968	146.6	8.69	15582	7667	7354	107.4	8.69	15582	7667	7354	107.4
1990	8898	12.53	24168	15270	14799	218.5	10.82	20874	11976	11531	170.2	8.78	16937	8040	8452	123.9	8.78	16937	8040	8452	123.9
1991	9897	12.53	25909	16013	16723	251.2	10.86	22455	12558	13033	195.7	8.85	18305	8408	9501	141.8	8.85	18305	8408	9501	141.8
1992	10956	12.53	27755	16799	18823	286.9	10.89	24131	13175	14674	223.6	8.92	19755	8799	10646	161.2	8.92	19755	8799	10646	161.2
1993	12082	12.53	29727	17645	21107	325.6	10.92	25923	13841	16457	253.9	8.98	21306	9224	11888	182.3	8.98	21306	9224	11888	182.3
1994	13284	12.53	31849	18565	23588	367.8	10.95	27853	14569	18393	286.9	9.04	22975	9692	13232	205.2	9.04	22975	9692	13232	205.2
1995	14562	12.53	34142	19579	26274	413.6	10.98	29937	15374	20488	322.7	9.09	24777	10214	14680	230.1	9.09	24777	10214	14680	230.1
1996	15924	12.53	36652	20728	29191	463.5	11.01	32223	16299	22761	361.8	9.14	26754	10830	16246	257.2	9.14	26754	10830	16246	257.2
1997	17378	12.53	39373	21995	32365	517.9	11.04	34699	17321	25237	404.3	9.19	28893	11515	17950	286.7	9.19	28893	11515	17950	286.7
1998	18933	12.53	42321	23389	35823	577.1	11.06	37378	18446	27936	450.7	9.24	31205	12272	19805	318.8	9.24	31205	12272	19805	318.8
1999	20600	12.53	45515	24914	39596	641.6	11.09	40281	19681	30883	501.3	9.28	33707	13107	21830	353.7	9.28	33707	13107	21830	353.7
2000	22386	12.53	48969	26583	43694	711.9	11.11	43418	21032	34092	556.4	9.31	36408	14022	24039	391.8	9.31	36408	14022	24039	391.8

Benefits and expenses	Fund D					Fund E					Fund F					
	Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance					
	Cont. rate	Contri- butions	Cash flow	Inte- rest	Fund	Cont. rate	Contri- butions	Cash flow	Inte- rest	Fund	Cont. rate	Contri- butions	Cash flow	Inte- rest	Fund	
(\$M)	(%)	(\$M)	(\$M)	(\$M)	(\$B)	(%)	(\$M)	(\$M)	(\$M)	(\$B)	(%)	(\$M)	(\$M)	(\$M)	(\$B)	
2001	24211	12.53	52746	28535	48090	788.5	11.12	46820	22609	37548	616.6	9.34	39316	15105	26425	433.3
2002	26192	12.53	56806	30614	52872	872.0	11.13	50482	24290	41312	682.2	9.36	42447	16255	29022	478.6
2003	28350	12.53	61156	32806	58069	962.9	11.14	54406	26056	45408	753.6	9.38	45805	17455	31849	527.9
2004	30717	12.53	65802	35085	63712	1061.7	11.16	58605	27888	49860	831.4	9.40	49406	18689	34921	581.5
2005	33319	12.53	70749	37430	69848	1169.0	11.17	63085	29767	54703	915.8	9.43	53257	19938	38260	639.7
2006	36143	12.53	76008	39864	76532	1285.3	11.18	67860	31716	59974	1007.5	9.45	57355	21212	41889	702.8
2007	39253	12.53	81578	42325	83773	1411.4	11.20	72917	33664	65678	1106.9	9.48	61714	22461	45807	771.0
2008	42691	12.53	87465	44773	91605	1547.8	11.21	78271	35580	71847	1214.3	9.50	66354	23663	50038	844.7
2009	46492	12.53	93672	47181	100062	1695.1	11.22	83926	37435	78509	1330.2	9.53	71285	24794	54600	924.1
2010	50716	12.53	100205	49489	109276	1853.8	11.24	89915	39198	85763	1455.2	9.57	76547	25830	59558	1009.5
2011	55448	12.53	106963	51515	119467	2024.8	11.26	96144	40696	93784	1589.7	9.61	82064	26616	65034	1101.2
2012	60572	12.53	114082	53510	130443	2208.8	11.27	102652	42080	102412	1734.2	9.65	87866	27294	70910	1199.4
2013	66197	12.53	121592	55395	142248	2406.4	11.29	109551	43355	111681	1889.2	9.69	94071	27874	77205	1304.5
2014	72344	12.53	129525	57181	154924	2618.5	11.30	116872	44528	121622	2055.4	9.74	100712	28367	83939	1416.8
2015	79026	12.53	137912	58885	168527	2845.9	11.32	124631	45605	132272	2233.2	9.79	107809	28783	91132	1536.7
2016	86209	12.53	146688	60479	183106	3089.5	11.34	132772	46564	143672	2423.5	9.85	115328	29119	98813	1664.6
2017	93979	12.53	156004	62024	198720	3350.3	11.36	141426	47446	155860	2626.8	9.91	123380	29401	107004	1801.0
2018	102353	12.53	165913	63559	215433	3629.2	11.37	150620	48267	168886	2843.9	9.96	131993	29640	115739	1946.4
2019	111361	12.53	176469	65109	233314	3927.7	11.38	160400	49039	182796	3075.8	10.02	141211	29851	125046	2101.3
2020	121027	12.53	187728	66700	252433	4246.8	11.40	170805	49778	197644	3323.2	10.08	151072	30045	134963	2266.3
2021	131451	12.53	199687	68236	272889	4587.9	11.41	181859	50409	213491	3587.1	10.14	161617	30166	145525	2442.0
2022	142627	12.53	212470	69843	294743	4952.5	11.42	193682	51055	230389	3868.5	10.20	172942	30315	156770	2629.1
2023	154555	12.53	226147	71593	318107	5342.2	11.43	206306	51751	248410	4168.7	10.25	185073	30519	168749	2828.3
2024	167264	12.53	240786	73522	343075	5758.8	11.43	219798	52534	267638	4488.9	10.30	198073	30809	181506	3040.7
2025	180761	12.53	256456	75694	369774	6204.3	11.44	234199	53438	288144	4830.5	10.35	211977	31215	195100	3267.0

Benefits and expenses	Fund D						Fund E						Fund F					
	Entry age normal funding						Entry age normal funding of retirement benefits, pay-go funding of balance						Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance					
	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)			
2026	195413	12.53	273091	77678	398318	6680.3	11.44	249474	54061	310013	5194.5	10.40	226813	31400	209587	3508.0		
2027	210839	12.53	290926	80087	428816	7189.2	11.44	265826	54986	333330	5582.8	10.45	242691	31852	225018	3764.8		
2028	226952	12.53	310064	83112	461439	7733.7	11.44	283311	56359	358203	5997.4	10.49	259646	32694	241472	4039.0		
2029	243730	12.53	330604	86874	496349	8317.0	11.44	302054	58323	384767	6440.5	10.52	277778	34048	259034	4332.1		
2030	261136	9.66	271852	10717	532455	8860.1	9.38	263958	2823	412236	6855.6	9.18	258387	-2747	277209	4606.5		
2031	278595	9.66	290150	11555	567231	9438.9	9.38	281730	3135	438802	7297.5	9.21	276625	-1969	294787	4899.4		
2032	296761	9.66	309748	12987	604298	10056.2	9.38	300795	4034	467106	7768.6	9.23	296099	-661	313549	5212.2		
2033	315758	9.66	330709	14951	643834	10715.0	9.38	321250	5492	497278	8271.4	9.25	316887	1129	333598	5547.0		
2034	335620	9.66	353096	17475	686036	11418.5	9.38	343096	7476	529489	8808.4	9.27	338974	3353	355061	5905.4		
2035	356399	9.66	376970	20571	731113	12170.2	9.38	366358	9959	563892	9382.2	9.28	362362	5964	378040	6289.4		
2036	377503	9.66	402365	24862	779290	12974.3	9.39	391107	13604	600681	9996.5	9.29	386986	9484	402669	6701.5		
2037	399975	9.66	429379	29403	830827	13834.6	9.39	417490	17514	640056	10654.1	9.29	413125	13150	429108	7143.8		
2038	424134	9.66	458080	33946	885953	14754.5	9.39	445620	21486	682202	11357.8	9.29	440903	16769	457469	7618.0		
2039	450241	9.66	488538	38297	944898	15737.7	9.40	475557	25315	727302	12110.4	9.30	470392	20150	487877	8126.1		
2040	478507	9.66	520822	42315	1007872	16787.8	9.41	507307	28800	775525	12914.7	9.30	501610	23102	520437	8669.6		
2041	508784	9.66	554792	46008	1075140	17909.0	9.41	540685	31900	827053	13773.7	9.30	534214	25429	555262	9250.3		
2042	541791	9.66	590778	48987	1146966	19104.9	9.41	575999	34208	882061	14689.9	9.30	568736	26945	592449	9869.7		
2043	577884	9.66	628901	51017	1223510	20379.5	9.42	613362	35478	940721	15666.1	9.29	605343	27459	632096	10529.2		
2044	617405	9.66	669281	51876	1305115	21736.5	9.42	652869	35464	1003197	16704.8	9.29	644181	26776	674302	11230.3		
2045	660694	9.66	712042	51348	1391933	23179.7	9.42	694616	33922	1069627	17808.3	9.29	685405	24711	719133	11974.2		
2046	708083	9.66	757301	49218	1484285	24713.2	9.42	738692	30609	1140223	18979.2	9.30	729153	21070	766684	12761.9		
2047	759921	9.66	805182	45261	1582356	26340.9	9.42	785198	25277	1215057	20219.5	9.30	775585	15664	817012	13594.6		
2048	816547	9.66	855805	39259	1686420	28066.5	9.41	834231	17684	1294316	21531.5	9.31	824847	8301	870184	14473.1		
2049	878286	9.66	909292	31006	1796736	29894.3	9.41	885870	7583	1378126	22917.2	9.31	877075	-1210	926258	15398.1		
2050	945465	9.66	965764	20299	1913525	31828.1	9.40	940196	-5268	1466596	24378.5	9.32	932405	-13060	985272	16370.3		

Source
Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Pay-go contribution rate(a)	Assumptions					
		Economic:					
		Fertility:		Most probable		Low	
		Most probable	Low/High	Low	High	Most probable	High
		(Percentage of earnings)					
1978	2.36	3.60	3.60	3.60	3.60	3.60	3.60
1980	2.86	12.53	12.67	12.60	12.41	12.49	12.61
1990	4.61	12.53	12.67	12.60	12.41	12.49	12.61
2000	5.73	12.53	12.67	12.60	12.41	12.49	12.61
2010	6.34	12.53	12.67	12.60	12.41	12.49	12.61
2020	8.08	12.53	12.67	12.60	12.41	12.49	12.61
2030	9.28	9.66	9.65	9.65	9.66	9.64	9.70
2040	8.87	9.66	9.65	9.65	9.66	9.64	9.70
2050	9.45	9.66	9.65	9.65	9.66	9.64	9.70

a Pay-go contribution rates are based on the most probable fertility and economic assumptions.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Assumptions:									
Economic:									
	Fertility:	Most probable		Low/high		Low		High	
		Most probable	Low	Low/high	Low	High	Most probable	High	
(Per cent)									
Entry age normal costs									
Retirement									
Non-indexed benefit		5.06	5.06	5.06	5.06	5.06	5.47	5.40	
Indexing cost		2.09	2.09	2.09	2.09	2.09	1.67	2.79	
Total		7.15	7.15	7.15	7.15	7.15	7.14	7.19	
Welfare - non-indexed benefit									
Disability		.38	.38	.38	.38	.38	.40	.34	
Survivor		1.05	1.05	1.05	1.05	1.05	1.18	.85	
Total		1.43	1.43	1.42	1.43	1.43	1.58	1.19	
Welfare - indexing cost									
Disability		.14	.14	.14	.14	.14	.12	.18	
Survivor		.84	.83	.83	.84	.84	.70	1.04	
Total		.98	.97	.97	.98	.98	.82	1.22	
Total		6.49	6.49	6.48	6.49	6.49	7.05	4.92	
Non-indexed benefit		3.07	3.06	3.06	3.07	3.07	2.49	4.68	
Indexing cost		9.56	9.55	9.54	9.56	9.56	9.54	9.60	
Total(a)									
Unfunded liabilities and fifty-year liquidation percentages(b)									
		(\$B)	(%)	(\$B)	(%)	(\$B)	(%)	(\$B)	(%)
Retirement									
Non-indexed benefit		47.3	1.38	47.3	1.45	47.3	1.42	47.3	1.32
Indexing cost		23.7	.69	23.7	.73	23.7	.71	23.7	.66
Total		71.0	2.07	70.9	2.18	70.9	2.13	71.0	1.98
Welfare									
Non-indexed benefit		15.2	.44	15.2	.47	15.2	.45	15.2	.42
Indexing cost		12.4	.36	12.3	.38	12.3	.37	12.4	.35
Total		27.5	.80	27.5	.84	27.5	.82	27.6	.77
Total									
Non-indexed benefit		62.5	1.82	62.5	1.92	62.5	1.87	62.5	1.74
Indexing cost		36.1	1.05	36.0	1.11	36.0	1.01	36.1	1.01
Total		98.5	2.87	98.4	3.02	98.4	2.95	98.5	2.75
Non-indexed benefit									
Indexing cost									
Total									
Non-indexed benefit									
Indexing cost									
Total									

a Excludes expenses which equal 1 per cent of contributory earnings. Costs are expressed as a percentage of contributory earnings.

b Contribution rate as a percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980 to 2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Canada Pension Plan, Comparison of Contribution Rates and Fund as a Multiple of Benefits for Funds A, B, and C, with Population Reduced to Eliminate the Baby Boom, Canada Less Quebec, 1978-2050

Pay-go	Contribution Rate			Fund as multiple of benefits		
	Fund A	Fund B	Fund C	Fund A	Fund B	Fund C
	(Percent)					
1978	2.44	3.60	3.60	10.5	10.5	10.5
1980	3.05	3.60	3.60	8.3	8.3	8.3
1990	4.96	3.60	3.62	3.4	4.4	3.4
2000	6.21	(a)	5.62	-	3.5	1.4
2010	6.94	6.94	6.67	-	3.0	.6
2020	8.26	8.26	8.12	-	2.4	.3
2030	8.26	8.90	8.82	-	2.2	.1
2040	8.91	8.91	8.87	-	2.2	.1
2050	9.34	9.34	9.22	-	2.1	.1

a Under Fund A, the fund would be exhausted in year 1999 and thereafter contribution would be at the pay-go rate unless other revenue were found. Under Fund A, the cash flow becomes negative in 1984. Interest is first required from the provinces and the fund reaches its maximum in 1989.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures
as a Percentage of Contributory Earnings, Using
Most Probable Economic and Fertility Assumptions
and Variations in Real Growth in Earnings, 1978-2050

Appendix D-8

	<u>Assumptions</u> Economic:	Most probable	Most probable -.5 per cent (Per cent)	Most probable +.5 per cent
1978		2.36	2.35	2.36
1980		2.86	2.87	2.85
1990		4.61	4.77	4.45
2000		5.73	6.01	5.47
2010		6.34	6.67	6.04
2020		8.08	8.49	6.84
2030		9.28	9.78	8.82
2040		8.87	9.41	8.38
2050		9.45	10.01	8.95

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario.

	Without earnings test	With earnings test
Year cash flow first negative	1986	1986
Year interest first required from provinces (maximum fund)	1992	1993
Year fund first becomes negative	2001	2003
a Contributions continue to be 3.6 per cent of contributory earnings.		

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as
a Percentage of Contributory Earnings, Fund B,(a)
with and without Earnings Test, Canada
Less Quebec, 1978-2050

Appendix D-10

	Without earnings test	With earnings test
Year cash flow first set to zero	1986	1986
Pay-go contributions in subsequent years, as percentage of contributory earnings		
1990	4.61	4.44
2000	5.73	5.55
2010	6.34	6.12
2020	8.08	7.76
2030	9.28	8.93
2040	8.87	8.62
2050	9.45	9.08
Fund as multiple of benefits		
1990	4.7	5.0
2000	3.8	4.0
2010	3.1	3.3
2020	2.4	2.6
2030	2.1	2.2
2040	2.1	2.3
2050	2.0	2.1

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario, using the Commission's most probable fertility and
economic assumptions.

Canada Pension Plan, Comparison of Expenditures as
a Percentage of Contributory Earnings, Fund C, (a)
with and without Earnings Test, Canada Less
Quebec, 1978-2050

Appendix D-11

	Without earnings test	With earnings test
Year cash flow first negative	1986	1986
Year cash flow, when negative, equals fund interest (fund remains stable)	1992	1993
Pay-go contributions in subsequent years as a percentage of contributory earnings		
2000	5.07	4.83
2010	6.05	5.80
2020	7.92	7.59
2030	9.19	8.84
2040	8.83	8.57
2050	9.43	9.06
Fund as multiple of benefits		
2000	1.61	1.84
2010	.71	.81
2020	.30	.34
2030	.14	.16
2040	.08	.09
2050	.04	.04

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario, using the Commission's most probable fertility and
economic assumptions.

Canada Pension Plan, Entry Age Normal Costs, Allocation
of Initial Assets and Unfunded Liabilities, with and
without Earnings Test, Canada Less Quebec, 1980-2029

Appendix D-12

Entry age normal costs(a)	Without earnings test	With earnings test
	(Per cent)	
Retirement		
Non-indexed benefit	5.06	4.97
Indexing cost	2.09	1.97
Total	7.15	6.94
Welfare - non-indexed benefit		
Disability	.38	.38
Survivor	1.05	1.07
Total	1.43	1.45
Welfare - indexing cost		
Disability	.14	.14
Survivor	.84	.83
Total	.98	.97
Total		
Non-indexed benefit	6.49	6.41
Indexing cost	3.07	2.94
Total(a)	9.56	9.35
Initial funds	(Billions of dollars)	
Retirement	9.7	9.6
Welfare	2.9	3.0
Total	12.6	12.6

Unfunded liabilities and fifty-year liquidation costs(b)

	(Billions of dollars)	(Per cent)	(Billions of dollars)	(Per cent)
Retirement				
Non-indexed benefit	47.3	1.38	45.0	1.30
Indexing cost	23.7	.69	21.6	.62
Total	71.0	2.07	66.6	1.92
Welfare				
Non-indexed benefit	15.2	.44	15.1	.44
Indexing cost	12.4	.36	11.9	.34
Total	27.6	.80	27.0	.78
Total				
Non-indexed benefit	62.5	1.82	60.1	1.74
Indexing cost	36.1	1.05	33.5	.96
Total	98.5	2.87	93.6	2.70

a Excludes expenses which equal 1 per cent of contributory earnings.

b Contribution rate as percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980 to 2029.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Year interest first required from provinces (maximum fund)	1992	1989
Year fund first becomes negative	2001	1999

a Contributions continue to be 3.6 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund B,(a) Including and Excluding the Baby Boom, Canada Less Quebec, and Ontario 1980-2050

	Canada less Quebec		Ontario	
	Total population	Excluding baby boom	Total population	Excluding baby boom
Year cash flow first set to zero	1986	1984	1985	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings				
1990	4.61	4.96	4.84	5.18
2000	5.73	6.21	6.07	6.56
2010	6.34	6.94	6.67	7.27
2020	8.08	8.26	8.27	8.46
2030	9.28	8.90	9.25	8.88
2040	8.87	8.91	8.76	8.79
2050	9.45	9.34	9.35	9.24
Fund as multiple of benefits				
1990	4.7	4.4	4.8	4.6
2000	3.8	3.5	4.0	3.8
2010	3.1	3.0	3.5	3.3
2020	2.4	2.4	2.9	2.9
2030	2.1	2.2	2.6	2.8
2040	2.1	2.2	2.8	2.9
2050	2.0	2.1	2.7	2.8

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Expenditures as Percentages of Contributory Earnings, and the Fund as a Multiple of Expenditures, Fund C,(a) Including and Excluding the Baby Boom, Canada Less Quebec, and Ontario

Appendix D-15

	Canada less Quebec		Ontario	
	Total population	Excluding baby boom	Total population	Excluding baby boom
Year cash flow first negative	1986	1984	1985	1984
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1989	1990	1989
Pay-go contributions in subsequent years, as percentage of contributory earnings			(Per cent)	
2000	5.07	6.21	6.07	6.56
2010	6.05	6.94	6.67	7.27
2020	7.92	8.26	8.27	8.46
2030	9.19	8.90	9.25	8.88
2040	8.83	8.91	8.76	8.79
2050	9.43	9.34	9.35	9.24
Fund as multiple of benefits				
2000	1.61	1.35	1.58	1.36
2010	.71	.60	.70	.61
2020	.30	.27	.30	.28
2030	.14	.13	.14	.14
2040	.08	.07	.08	.07
2050	.04	.03	.04	.04

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund (Billions of dollars)	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)				
1978	1,366	3.60	2,087	721	1,012	1,733	14.3	10.49
1979	1,727	3.60	2,370	644	1,163	1,807	16.1	9.34
1980	2,129	3.60	2,681	552	1,309	1,862	18.0	8.45
1981	2,537	3.60	3,035	498	1,455	1,953	20.0	7.86
1982	2,999	3.60	3,414	414	1,608	2,022	22.0	7.33
1983	3,476	3.60	3,814	338	1,766	2,105	24.1	6.93
1984	4,013	3.60	4,233	220	1,930	2,151	26.2	6.54
1985	4,615	4.00	5,185	570	2,105	2,676	28.9	6.26
1986	5,339	4.20	5,938	599	2,311	2,910	31.8	5.96
1987	6,131	4.40	6,755	624	2,544	3,168	35.0	5.71
1988	6,992	4.60	7,641	650	2,798	3,447	38.4	5.50
1989	7,915	4.80	8,603	689	3,066	3,755	42.2	5.33
1990	8,898	5.00	9,647	750	3,338	4,087	46.3	5.20
1991	9,897	5.30	10,963	1,066	3,592	4,659	50.9	5.15
1992	10,956	5.50	12,187	1,231	3,886	5,118	56.0	5.12
1993	12,082	5.80	13,765	1,683	4,212	5,895	61.9	5.13
1994	13,284	6.00	15,256	1,973	4,579	6,551	68.5	5.16
1995	14,562	6.30	17,172	2,610	4,980	7,590	76.1	5.22
1996	15,924	6.60	19,313	3,388	5,442	8,831	84.9	5.33
1997	17,378	6.90	21,689	4,311	5,982	10,293	95.2	5.48
1998	18,933	7.30	24,665	5,733	6,620	12,353	107.6	5.68
1999	20,600	7.60	27,616	7,016	7,390	14,406	122.0	5.92
2000	22,386	8.00	31,276	8,891	8,310	17,201	139.2	6.22

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund (Billions of dollars)	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)				
2001	24,211	8.00	33,688	9,477	9,392	18,870	158.0	6.53
2002	26,192	8.00	36,282	10,090	10,581	20,671	178.7	6.82
2003	28,350	8.00	39,060	10,710	11,884	22,594	201.3	7.10
2004	30,717	8.00	42,027	11,310	13,308	24,618	225.9	7.35
2005	33,319	8.00	45,187	11,868	14,861	26,729	252.6	7.58
2006	36,143	8.00	48,546	12,402	16,547	28,949	281.6	7.79
2007	39,253	8.00	52,103	12,850	18,366	31,216	312.8	7.97
2008	42,691	8.00	55,863	13,172	20,321	33,493	346.3	8.11
2009	46,492	8.00	59,828	13,336	22,417	35,753	382.1	8.22
2010	50,716	8.00	64,001	13,284	24,664	37,948	420.0	8.28
2011	55,448	8.00	68,317	12,868	27,086	39,955	460.0	8.30
2012	60,573	8.00	72,863	12,291	29,634	41,925	501.9	8.29
2013	66,197	8.00	77,660	11,463	32,304	43,767	545.7	8.24
2014	72,344	8.00	82,727	10,382	35,088	45,470	591.1	8.17
2015	79,026	8.00	88,083	9,057	37,977	47,033	638.2	8.08
2016	86,209	8.00	93,689	7,480	40,962	48,442	686.6	7.96
2017	93,979	8.00	99,639	5,659	44,033	49,692	736.3	7.83
2018	102,353	8.00	105,967	3,614	47,180	50,794	787.1	7.69
2019	111,361	8.00	112,710	1,349	50,395	51,744	838.8	7.53
2020	121,027	8.00	119,901	-1,127	53,667	52,540	891.4	7.37
2021	131,451	8.00	127,538	-3,912	56,985	53,073	944.4	7.18
2022	142,627	8.00	135,703	-6,924	60,333	53,409	997.9	7.00
2023	154,555	8.00	144,439	-10,116	63,701	53,585	1,051.4	6.80
2024	167,264	8.00	153,789	-13,475	67,076	53,601	1,105.0	6.61
2025	180,761	8.00	163,797	-16,965	70,450	53,485	1,158.5	6.41

	Benefits and expenses	Contribution rate	Contributions	Cash flow	Interest on loan	Loan	Fund (Billions of dollars)	Fund as multiple of benefits
	(Millions of dollars)	(Per cent)		(Millions of dollars)				
2026	195,413	8.00	174,421	-20,992	73,809	52,817	1,211.3	6.20
2027	210,839	8.00	185,813	-25,027	77,124	52,097	1,263.4	5.99
2028	226,952	8.00	198,036	-28,916	80,397	51,481	1,314.9	5.79
2029	243,730	8.00	211,155	-32,576	83,633	51,057	1,366.0	5.60
2030	261,136	8.00	225,236	-35,900	86,847	50,947	1,416.9	5.43
2031	278,595	8.00	240,395	-38,200	90,071	51,871	1,468.8	5.27
2032	296,761	8.00	256,633	-40,128	93,360	53,232	1,522.0	5.13
2033	315,758	8.00	274,000	-41,758	96,741	54,983	1,577.0	4.99
2034	335,620	8.00	292,547	-43,073	100,239	57,166	1,634.2	4.87
2035	356,399	8.00	312,327	-44,071	103,880	59,809	1,694.0	4.75
2036	377,503	8.00	333,368	-44,135	107,709	63,574	1,757.6	4.66
2037	399,975	8.00	355,749	-44,226	111,775	67,549	1,825.1	4.56
2038	424,134	8.00	379,529	-44,605	116,093	71,488	1,896.6	4.47
2039	450,241	8.00	404,764	-45,477	120,654	75,177	1,971.8	4.38
2040	478,507	8.00	431,513	-46,995	125,441	78,446	2,050.2	4.28
2041	508,784	8.00	459,657	-49,127	130,427	81,300	2,131.5	4.19
2042	541,791	8.00	489,472	-52,319	135,579	83,260	2,214.8	4.09
2043	577,884	8.00	521,058	-56,826	140,835	84,009	2,298.8	3.98
2044	617,405	8.00	554,514	-62,891	146,114	83,223	2,382.0	3.86
2045	660,694	8.00	589,942	-70,752	151,316	80,564	2,462.6	3.73
2046	708,083	8.00	627,440	-80,643	156,314	75,671	2,538.2	3.58
2047	759,921	8.00	667,111	-92,811	160,962	68,151	2,606.4	3.43
2048	816,547	8.00	709,054	-107,493	165,088	57,595	2,664.0	3.26
2049	878,286	8.00	753,368	-124,918	168,495	43,577	2,707.6	3.08
2050	945,465	8.00	800,157	-145,309	170,958	25,649	2,733.2	2.89

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX E - COMPARISON OF ROYAL COMMISSION PROJECTIONS WITH STATUTORY
ACTUARIAL REPORT NO. 6 ON THE CANADA PENSION PLAN AS AT
DECEMBER 31, 1977

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	Department of Insurance		Royal Commission			
	1978	1983 and later	1978	1979	1980-84	1985-89 1990 and later
	(Per cent)					
Economic assumptions						
Investment rate of return	9.4	6.5	9.0	8.3	7.9	7.6 6.4
Average earnings growth	6.7	5.5	7.0	8.0	7.3	7.0 6.1
Inflation	9.0	3.5	7.3	6.0	5.5	5.0 4.0
Growth in real wages	-2.3	2.0	-3	2.0	1.8	2.0 2.1
Real investment return	.4	3.0	1.7	2.3	2.4	2.6 2.4
Fertility assumptions						
Net reproduction rate	.89	1.00	.89	1.20	1.10	1.00
Total fertility rate	1.87	2.112	1.87	2.50	2.25	2.06
Immigration/emigration						
Initial level	160,000 (1971)	60,000 (1971)			100,000 (1978)	40,000 (1978)
Annual rate of increase	1.5% (1971-95)	1.5% (1971-95)			.5% (1978-2000)	.5% (1978-2000)
applicable to initial level	1.0% (1995-2025)	1.0% (1995-2025)			— (2000 & later)	— (2000 & later)
	.8% (2025 & later)	.8% (2025 & later)				
Migration						
Immigration to Quebec(a)	17.33%	25%				15%
Emigration from Quebec(a)	29.84%	25%				25%
Net immigration Quebec to rest of Canada	22,017	—				20,000 in 1978 grading to 5,000 in 2000 and later

a Expressed as a percentage of total Canadian immigration and emigration, respectively.

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Department of Insurance and Royal Commission Projections of Expenditures as a Percentage of Contributory Earnings, Canada Less Quebec, 1978-2050

Appendix E-2

	Department of Insurance	Royal Commission	Ratio of column 2 to column 1
	(1)	(2) (Per cent)	(3)
1978	2.38	2.36	.992
1980	2.90	2.86	.986
1990	4.57	4.61	1.009
2000	5.53	5.73	1.036
2010	6.20	6.34	1.023
2025	8.62	8.83	1.024
2030	9.09	9.28	1.021
2050	8.76	9.45	1.079

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Canada Pension Plan, Comparison of Financial
Projections by Department of Insurance and the
Royal Commission, Various Items, Canada Less
Quebec, 1980-2050

Appendix E-3

	Royal Commission	Department of Insurance	Ratio of Column 1 to Column 2
	(1)	(2)	(3)
Population - males		(Thousands)	
1980	9,165	9,128	1.004
2000	11,861	12,052	.984
2025	14,498	15,464	.938
2050	16,321	18,743	.871
Population - females			
1980	9,146	9,103	1.005
2000	11,987	12,156	.986
2025	14,884	15,794	.942
2050	16,915	19,251	.879
Projected expenditures		(Billions of dollars)	
1978	1.4	1.4	1.00
2000	22.4	18.4	1.22
2025	180.8	135.6	1.33
2050	945.5	636.2	1.49
Pay-go contributions		(Percentage of contributory earnings)	
1978	2.36	2.38	.992
2000	5.73	5.53	1.036
2025	8.83	8.62	1.024
2050	9.45	8.76	1.079
Entry age normal costs	9.50	8.04	1.18
Unfunded actuarial liability, December 31, 1977		(Billions of dollars)	
	98.5	81.3	1.21

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

Assumptions		Most probable		Low		High	
Economic:		Low/High		Most probable		Most probable	
Fertility:		Low/High		Most probable		Most probable	
Year cash flow first negative	1986	1986	1986	1986	1985	1986	1986
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1991	1991	1991	1991	1992	1992
Pay-go contributions in subsequent years, as percentage of earnings							
2000	5.07	5.14	5.12	5.01	5.12	4.95	4.95
2010	6.05	6.48	6.31	5.72	6.07	6.02	6.02
2025	8.72	9.75	9.16	8.04	8.74	8.70	8.70
2030	9.19	10.53	9.74	8.41	9.21	9.17	9.17
2050	9.43	10.58	9.48	9.11	9.48	9.33	9.33
Fund as multiple of benefits in current year							
2000	1.61	1.62	1.62	1.60	1.84	1.27	1.27
2010	.71	.72	.72	.71	.89	.46	.46
2025	.20	.20	.20	.20	.29	.10	.10
2030	.14	.14	.14	.14	.21	.06	.06
2050	.04	.04	.04	.04	.07	.01	.01

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

Assumptions:	Royal Commission	Department of Insurance Table References(a)							
		Table 1	Table 5	Table 6	Table 7	Table 8	Table 9	Table 10	
					(Per cent)				
Earnings		5.5	5.5	6.0	6.5	5.5	5.5	5.5	
Inflation	Most	3.5	4.0	3.5	4.5	3.5	3.5	4.0	
Investment		6.5	6.5	6.5	7.5	6.5	6.5	6.5	
Fertility (NRR)	probable	1.00	1.00	1.00	1.00	1.00	.85	.85	
Net immigration (as percentage of current population)		.465	.465	.465	.465	100,000	.465	100,000	
Year cash flow, when negative, equals fund interest (fund remains stable)	1991	1992	1991	1991	1992	1992	1992	1990	
Pay-go contributions in subsequent years, as percentage of earnings									
2000	5.07	4.84	5.11	4.91	4.80	4.98	4.87	5.28	
2010	6.05	5.85	6.16	5.88	5.84	6.08	6.06	6.66	
2025	8.72	8.48	8.91	8.49	8.46	9.01	9.23	10.38	
2030	9.19	8.98	9.45	8.99	8.95	9.61	9.98	11.36	
2050	9.43	8.73	9.23	8.74	8.69	9.45	10.03	11.76	
Fund as multiple of benefits in current year									
2000	1.61	1.89	1.73	1.84	1.66	1.86	1.90	1.72	
2010	.71	.87	.79	.85	.70	.87	.88	.80	
2025	.20	.26	.23	.25	.18	.26	.26	.24	
2030	.14	.18	.16	.17	.12	.18	.18	.17	
2050	.04	.05	.05	.05	.03	.06	.06	.06	

a These tables can be found in the Department of Insurance, "Statutory Actuarial Report No. 6."

Source Department of Insurance, "Canada Pension Plan Statutory Actuarial Report No. 6 as at December 31, 1977," and data prepared for the Royal Commission on the Status of Pensions in Ontario using the Commission's most probable fertility and economic assumptions.

APPENDIX F - OLD AGE SECURITY, GUARANTEED INCOME SUPPLEMENT AND SPOUSE'S ALLOWANCE PROJECTED EXPENDITURES

(All based on the Royal Commission's most probable fertility,
immigration and economic assumptions)

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	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed
	Non-indexed	indexing only		Non-indexed	indexing only		Non-indexed	indexing only	
1979	4,299	4,315	4,403	1.68	1.68	1.72	4.98	5.00	5.10
1980	4,420	4,456	4,794	1.58	1.59	1.71	4.55	4.59	4.93
1985	4,941	5,355	6,992	1.13	1.23	1.60	2.98	3.23	4.22
1990	5,623	7,322	10,113	.88	1.15	1.59	2.30	3.00	4.14
1995	6,191	9,694	13,558	.69	1.09	1.52	1.80	2.82	3.95
2000	6,626	12,535	17,655	.52	.98	1.38	1.35	2.56	3.60
2005	6,988	15,994	22,654	.38	.87	1.23	.99	2.27	3.22
2010	7,724	21,844	30,467	.30	.84	1.17	.78	2.21	3.08
2015	8,985	31,478	43,120	.25	.88	1.21	.66	2.32	3.18
2020	10,423	44,547	60,857	.22	.93	1.27	.57	2.42	3.31
2025	11,891	61,322	84,465	.18	.94	1.30	.48	2.46	3.39
2030	13,099	80,829	113,207	.15	.91	1.28	.38	2.37	3.32
2035	13,380	97,346	140,674	.11	.80	1.15	.28	2.06	2.98
2040	13,224	114,352	169,161	.08	.67	.99	.20	1.76	2.60
2045	13,514	143,028	210,335	.06	.62	.91	.15	1.61	2.37
2050	14,565	191,966	275,814	.05	.61	.88	.12	1.60	2.30

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Millions of dollars			Percentage of GNP		Percentage of CPP contributory earnings			
	Pre-retirement		Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully Indexed
	Non-indexed	indexing only							
1979	3,228	3,241	3,306	1.66	1.67	1.70	4.90	4.92	5.02
1980	3,317	3,344	3,597	1.54	1.55	1.67	4.45	4.49	4.83
1985	3,690	3,999	5,221	1.10	1.19	1.55	2.85	3.09	4.03
1990	4,184	5,448	7,526	.84	1.09	1.51	2.17	2.82	3.90
1995	4,580	7,172	10,031	.65	1.02	1.42	1.68	2.63	3.68
2000	4,881	9,234	13,006	.48	.91	1.28	1.25	2.36	3.33
2005	5,147	11,781	16,687	.35	.80	1.13	.91	2.08	2.95
2010	5,681	16,065	22,407	.27	.77	1.07	.71	2.01	2.80
2015	6,645	23,279	31,889	.23	.81	1.11	.60	2.12	2.90
2020	7,740	33,082	45,194	.20	.85	1.16	.52	2.21	3.02
2025	8,856	45,672	62,910	.17	.86	1.18	.43	2.23	3.07
2030	9,812	60,544	84,796	.13	.83	1.16	.35	2.15	3.01
2035	10,130	73,708	106,514	.10	.73	1.05	.26	1.89	2.73
2040	10,171	87,952	130,107	.07	.63	.93	.19	1.63	2.41
2045	10,486	110,975	163,199	.05	.58	.85	.14	1.50	2.21
2050	11,296	148,879	213,907	.04	.57	.82	.11	1.49	2.14

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Millions of dollars			Percentage of GPP (Ontario)			Percentage of Ontario's CPP contributory earnings		
	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed
	Non-indexed	indexing only		Non-indexed	indexing only		Non-indexed	indexing only	
1979	1,572	1,578	1,610	1.56	1.57	1.59	4.69	4.71	4.81
1980	1,614	1,628	1,751	1.45	1.46	1.58	4.27	4.30	4.63
1985	1,793	1,943	2,537	1.04	1.13	1.47	2.74	2.96	3.87
1990	2,069	2,694	3,722	.82	1.06	1.47	2.14	2.78	3.84
1995	2,302	3,605	5,042	.64	1.01	1.41	1.69	2.65	3.70
2000	2,477	4,686	6,600	.48	.92	1.29	1.27	2.40	3.38
2005	2,623	6,003	8,503	.35	.81	1.15	.93	2.13	3.02
2010	2,895	8,187	11,419	.28	.78	1.09	.73	2.05	2.86
2015	3,375	11,824	16,197	.23	.82	1.13	.62	2.15	2.95
2020	3,865	16,520	22,569	.20	.84	1.15	.52	2.21	3.02
2025	4,357	22,469	30,949	.16	.83	1.15	.43	2.19	3.02
2030	4,795	29,591	41,444	.13	.80	1.12	.34	2.10	2.94
2035	4,929	35,866	51,830	.10	.70	1.01	.25	1.83	2.64
2040	4,950	42,810	63,329	.07	.60	.89	.18	1.58	2.33
2045	5,114	54,124	79,595	.05	.56	.82	.14	1.46	2.14
2050	5,528	72,859	104,683	.04	.55	.79	.11	1.44	2.07

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement indexing only		Non-indexed	Pre-retirement indexing only		Non-indexed	Pre-retirement indexing only	
		Fully indexed	Fully indexed		Fully indexed	Fully indexed		Fully indexed	Fully indexed
1979	1,535	1,540	1,627	.60	.60	.64	1.78	1.78	1.88
1980	1,553	1,565	1,736	.55	.56	.62	1.60	1.61	1.79
1985	1,618	1,803	2,354	.37	.41	.54	.98	1.09	1.42
1990	1,710	2,277	3,145	.27	.36	.49	.70	.93	1.29
1995	1,822	2,914	4,076	.20	.33	.46	.53	.85	1.19
2000	1,906	3,683	5,188	.15	.29	.41	.39	.75	1.06
2005	1,968	4,598	6,513	.11	.25	.35	.28	.65	.93
2010	2,129	6,145	8,571	.08	.24	.33	.22	.62	.87
2015	2,415	8,637	11,832	.07	.24	.33	.18	.64	.87
2020	2,730	11,914	16,276	.06	.24	.34	.15	.65	.89
2025	3,031	15,961	21,986	.05	.25	.34	.12	.64	.88
2030	3,254	20,500	28,712	.04	.23	.32	.10	.60	.84
2035	3,240	24,067	34,779	.03	.19	.28	.07	.51	.74
2040	3,124	27,580	40,800	.02	.16	.24	.05	.42	.63
2045	3,115	33,660	49,500	.01	.14	.21	.04	.38	.56
2050	3,270	44,010	63,234	.01	.14	.20	.03	.37	.53

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Millions of dollars			Percentage of GNP			Percentage of CPP contributory earnings		
	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed	Pre-retirement		Fully indexed
	Non-indexed	indexing only		Non-indexed	indexing only		Non-indexed	indexing only	
1979	1,086	1,090	1,151	.56	.56	.59	1.65	1.66	1.75
1980	1,097	1,105	1,226	.51	.51	.57	1.47	1.48	1.65
1985	1,141	1,271	1,660	.34	.38	.49	.88	.98	1.28
1990	1,205	1,605	2,217	.24	.32	.45	.62	.83	1.15
1995	1,280	2,047	2,863	.18	.29	.41	.47	.75	1.05
2000	1,338	2,585	3,641	.13	.25	.36	.34	.66	.93
2005	1,382	3,230	4,575	.09	.22	.31	.24	.57	.81
2010	1,492	4,307	6,007	.07	.21	.29	.19	.54	.75
2015	1,700	6,082	8,332	.06	.21	.29	.15	.55	.76
2020	1,925	8,398	11,473	.05	.22	.29	.13	.56	.77
2025	2,140	11,270	15,524	.04	.21	.29	.10	.55	.76
2030	2,308	14,541	20,366	.03	.20	.28	.08	.52	.72
2035	2,320	17,238	24,911	.02	.17	.25	.06	.44	.64
2040	2,273	20,070	29,690	.02	.14	.21	.04	.37	.55
2045	2,285	24,696	36,319	.01	.13	.19	.03	.33	.49
2050	2,397	32,259	46,350	.01	.12	.18	.02	.32	.46

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

	Millions of dollars		Percentage of GPP (Ontario)			Percentage of Ontario's CPP contributory earnings		
	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only	Fully indexed	Non-indexed	Pre-retirement indexing only
1979	451	452	478	.45	.45	.47	1.35	1.35
1980	456	460	510	.41	.41	.46	1.21	1.22
1985	473	527	688	.27	.30	.40	.72	.80
1990	508	676	934	.20	.27	.37	.52	.70
1995	548	875	1,225	.15	.25	.34	.40	.64
2000	577	1,114	1,570	.11	.22	.31	.30	.57
2005	599	1,400	1,983	.08	.19	.27	.21	.50
2010	647	1,868	2,606	.06	.18	.25	.16	.47
2015	736	2,631	3,605	.05	.18	.25	.12	.48
2020	821	3,583	4,896	.04	.18	.25	.11	.48
2025	899	4,735	6,522	.03	.18	.24	.09	.46
2030	965	6,078	8,513	.03	.16	.23	.07	.43
2035	966	7,174	10,368	.02	.14	.20	.05	.37
2040	947	8,360	12,368	.01	.12	.17	.03	.31
2045	954	10,314	15,168	.01	.11	.16	.03	.28
2050	1,004	13,507	19,407	.01	.10	.15	.02	.27

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's most probable fertility and economic assumptions.

APPENDIX G - SELECTED CANADA PENSION PLAN PROJECTIONS, CANADA LESS QUEBEC

(Based on the Royal Commission's high economic and low/low fertility assumptions.)

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Canada Pension Plan Comparison of Expenditures in Millions of Dollars
and as a Percentage of Contributory Earnings, Based on Low/Low
Fertility Assumptions, Together with High Economic Assumptions,
Canada less Quebec, 1978-2050

Appendix G-1

	High economic and low/low fertility				
	Expenditures in millions of dollars		Percentage of contributory earnings		
	Contributory earnings	Total expenditures	Non-indexed benefit	Indexing cost	Total
1978	58,370	1,382	2.10	.27	2.37
1979	66,746	1,764	2.25	.39	2.64
1980	76,169	2,198	2.37	.52	2.89
1981	86,599	2,640	2.41	.64	3.05
1982	98,235	3,153	2.45	.76	3.21
1983	111,170	3,700	2.47	.86	3.33
1984	125,496	4,332	2.50	.96	3.45
1985	141,308	5,060	2.53	1.05	3.58
1986	159,419	5,934	2.58	1.14	3.72
1987	179,019	6,922	2.65	1.22	3.87
1988	200,021	8,032	2.72	1.30	4.02
1989	222,336	9,267	2.80	1.37	4.17
1990	245,876	10,632	2.89	1.43	4.32
1995	378,878	19,481	3.37	1.77	5.14
2000	586,436	33,297	3.62	2.06	5.68
2010	1,373,794	92,215	4.19	2.52	6.71
2020	3,018,227	265,921	5.58	3.23	8.81
2030	6,533,550	689,639	6.48	4.08	10.56
2040	14,463,858	1,504,361	6.02	4.38	10.40
2050	31,643,408	3,316,009	6.16	4.32	10.48
Expenses are "non-indexed"					

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario.

	Assumptions:						High	
	Economic:			Most probable			Most probable	
	Fertility:			Low			Low	
Entry age normal costs								
Retirement								
Non-indexed benefit								
Indexing cost								
Total								
Welfare - non-indexed benefit								
Disability								
Survivor								
Total								
Welfare - indexing cost								
Disability								
Survivor								
Total								
Total								
Non-indexed benefit								
Indexing cost								
Total(a)								
Unfunded liabilities and fifty-year liquidation percentages(b)								
	(\$B) (%)	(\$B) (%)	(\$B) (%)	(\$B) (%)	(\$B) (%)	(\$B) (%)	(\$B) (%)	(\$B) (%)
Retirement								
Non-indexed benefit	47.3	1.38	47.3	1.45	47.3	1.32	49.2	1.48
Indexing cost	23.7	.69	23.7	.73	23.7	.66	18.8	.57
Total	71.0	2.07	70.9	2.18	70.9	1.98	68.0	2.05
Welfare								
Non-indexed benefit	15.2	.44	15.2	.47	15.2	.42	16.3	.49
Indexing cost	12.4	.36	12.3	.37	12.4	.35	10.1	.31
Total	27.5	.80	27.5	.84	27.5	.77	26.5	.80
Total								
Non-indexed benefit	62.5	1.82	62.5	1.92	62.5	1.74	65.5	1.97
Indexing cost	36.1	1.05	36.0	1.11	36.1	1.01	28.9	.88
Total	98.5	2.87	98.4	3.02	98.4	2.75	94.4	2.85

a Excludes expenses which equal 1 per cent of contributory earnings. Costs are expressed as a percentage of contributory earnings.

b Contribution rates as a percentage of contributory earnings required to liquidate unfunded liability over fifty-year period from 1980-2029.

	Fund A					Fund B					Fund C				
	3.6% contribution rate					Cash flow not negative					Cash flow not greater than interest when negative				
	Benefits and expenses (\$M)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)	Contri- bution rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)	Contri- bution rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inter- est (\$M)	Fund (\$B)
1978	1382	2101	719	1018	14.3	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3
1979	1764	2403	639	1196	16.2	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2
1980	2198	2742	544	1373	18.1	3.60	2742	544	1373	18.1	3.60	2742	544	1373	18.1
1981	2640	3118	478	1562	20.1	3.60	3118	478	1562	20.1	3.60	3118	478	1562	20.1
1982	3153	3536	383	1761	22.3	3.60	3536	383	1761	22.3	3.60	3536	383	1761	22.3
1983	3700	4002	302	1971	24.5	3.60	4002	302	1971	24.5	3.60	4002	302	1971	24.5
1984	4332	4518	186	2194	26.9	3.60	4518	186	2194	26.9	3.60	4518	186	2194	26.9
1985	5060	5087	27	2424	29.4	3.60	5087	27	2424	29.4	3.60	5087	27	2424	29.4
1986	5934	5739	-194	2658	31.8	3.72	5934	0	2663	32.0	3.60	5739	-194	2658	31.8
1987	6922	6445	-476	2908	34.3	3.87	6922	0	2939	35.0	3.60	6445	-476	2908	34.3
1988	8032	7201	-830	3161	36.6	4.02	8032	0	3249	38.2	3.60	7201	-830	3161	36.6
1989	9267	8004	-1262	3395	38.7	4.17	9267	0	3581	41.8	3.60	8004	-1262	3395	38.7
1990	10632	8852	-1779	3596	40.5	4.32	10632	0	3927	45.7	3.60	8852	-1779	3596	40.5
1991	12090	9674	-2415	3740	41.9	4.50	12090	0	4263	50.0	3.60	9674	-2415	3740	41.9
1992	13690	10551	-3138	3848	42.6	4.67	13690	0	4633	54.6	3.60	10551	-3138	3848	42.6
1993	15446	11495	-3950	3901	42.5	4.84	15446	0	5032	59.7	3.59	11455	-3990	3991	42.6
1994	17373	12520	-4852	3885	41.6	5.00	17373	0	5462	65.1	3.85	13382	-3990	3991	42.6
1995	19481	13640	-5840	3781	39.5	5.14	19481	0	5919	71.0	4.09	15496	-3984	3985	42.6
1996	21759	14878	-6880	3579	36.2	5.27	21759	0	6409	77.4	4.30	17784	-3974	3975	42.6
1997	24255	16234	-8020	3268	31.4	5.38	24255	0	6938	84.4	4.50	20290	-3964	3965	42.6
1998	26992	17718	-9273	2818	25.0	5.48	26992	0	7504	91.9	4.69	23062	-3929	3930	42.6
1999	30000	19340	-10659	2169	16.5	5.58	30000	0	8102	100.0	4.86	26095	-3904	3905	42.6
2000	33297	21112	-12184	1310	5.6	5.68	33297	0	8756	108.7	5.02	29420	-3876	3877	42.6

	Fund A					Fund B					Fund C				
	3.6% contribution rate					Cash flow not negative					Cash flow not greater than interest when negative				
	Benefits and expenses (\$M)	Contri-butions (\$M)	Cash flow (\$M)	Inter-est (\$M)	Fund (\$B)	Contri-bution rate (%)	Contri-butions (\$M)	Cash flow (\$M)	Inter-est (\$M)	Fund (\$B)	Contri-bution rate (%)	Contri-butions (\$M)	Cash flow (\$M)	Inter-est (\$M)	Fund (\$B)
2001	36733	23037	-13696	231	-7.8	5.74	36733	0	9464	118.2	5.14	32887	-3846	3847	42.6
2002	40552	25133	-15418	-981	-24.2	5.81	40552	0	10228	128.4	5.26	36736	-3814	3815	42.6
2003	44807	27412	-17394	-2401	-44.0	5.88	44807	0	11055	139.5	5.39	41025	-3781	3782	42.6
2004	49569	29884	-19683	-4112	-67.8	5.97	49569	0	11950	151.4	5.52	45822	-3746	3747	42.6
2005	54902	32563	-22338	-6166	-96.3	6.07	54902	0	12921	164.4	5.66	51184	-3717	3718	42.6
2006	60703	35446	-25256	-8622	-130.2	6.17	60703	0	13976	178.3	5.79	57019	-3683	3684	42.6
2007	67221	38562	-28658	-11540	-170.4	6.28	67221	0	15112	193.5	5.94	63574	-3646	3647	42.6
2008	74570	41925	-32644	-15000	-218.1	6.40	74570	0	16337	209.8	6.09	70959	-3610	3611	42.6
2009	82851	45552	-37298	-19100	-274.5	6.55	82851	0	17661	227.5	6.27	79274	-3576	3577	42.6
2010	92215	49457	-42757	-23952	-341.2	6.71	92215	0	19106	246.6	6.45	88638	-3576	3577	42.6
2011	102737	53606	-49131	-29690	-420.0	6.90	102737	0	20711	267.3	6.66	99161	-3576	3577	42.6
2012	114385	58076	-56308	-36462	-512.8	7.09	114385	0	22451	289.7	6.87	110808	-3576	3577	42.6
2013	127424	62893	-64529	-44427	-621.7	7.29	127424	0	24336	314.1	7.09	123847	-3576	3577	42.6
2014	141964	68086	-73876	-53776	-749.4	7.51	141964	0	26381	340.4	7.32	138387	-3576	3577	42.6
2015	158092	73682	-84409	-64720	-898.5	7.72	158092	0	28597	369.0	7.55	154516	-3576	3577	42.6
2016	175677	79646	-96030	-77489	-1072.0	7.94	175677	0	30999	400.0	7.78	172100	-3576	3577	42.6
2017	195117	86083	-109033	-92339	-1273.4	8.16	195117	0	33603	433.6	8.01	191540	-3576	3577	42.6
2018	216535	93035	-123500	-109559	-1506.5	8.38	216535	0	36426	470.1	8.24	212959	-3576	3577	42.6
2019	240089	100545	-139543	-129472	-1775.5	8.60	240089	0	39485	509.5	8.47	235513	-3575	3576	42.6
2020	265921	108656	-157264	-152442	-2085.2	8.81	265921	0	42802	552.4	8.69	262345	-3575	3576	42.6
2021	294170	117315	-176854	-178869	-2440.9	9.03	294170	0	46397	598.7	8.92	290593	-3576	3577	42.6
2022	325121	126684	-198436	-209203	-2848.6	9.24	325121	0	50295	649.0	9.14	321545	-3575	3576	42.6
2023	358896	136830	-222065	-243941	-3314.6	9.44	358896	0	54520	703.6	9.35	355319	-3576	3577	42.6
2024	395693	147819	-247872	-283628	-3846.1	9.64	395693	0	59099	762.7	9.55	392116	-3575	3576	42.6
2025	435650	159719	-275930	-328859	-4450.9	9.82	435650	0	64063	826.7	9.74	432073	-3575	3576	42.6

	Fund A					Fund B					Fund C				
	3.6% contribution rate					Cash flow not negative					Cash flow not greater than interest when negative				
	Benefits and expenses (\$M)	Contributions (\$M)	Cash flow (\$M)	Interest est (\$M)	Fund (\$B)	Contributions rate (%)	Contributions (\$M)	Cash flow (\$M)	Interest est (\$M)	Fund (\$B)	Contributions rate (%)	Contributions (\$M)	Cash flow (\$M)	Interest est (\$M)	Fund (\$B)
2026	479804	172396	-307407	-380329	-5138.6	10.02	479804	0	69445	896.2	9.94	476227	-3575	3576	42.6
2027	527318	186166	-341152	-438807	-5918.6	10.20	527318	0	75278	971.4	10.13	523742	-3575	3576	42.6
2028	578091	201147	-376943	-505070	-6800.6	10.35	578091	0	81601	1053.0	10.28	574515	-3575	3576	42.6
2029	632191	217455	-414734	-579959	-7795.3	10.47	632191	0	88455	1141.5	10.41	628614	-3575	3576	42.6
2030	689639	235208	-454430	-664345	-8914.1	10.56	689639	0	95885	1237.4	10.50	686063	-3575	3576	42.6
2031	748939	254430	-494508	-759161	-10167.7	10.60	748939	0	103940	1341.3	10.55	745362	-3576	3577	42.6
2032	812098	275353	-536745	-865358	-11569.8	10.62	812098	0	112671	1454.0	10.57	808522	-3576	3577	42.6
2033	879615	298116	-581498	-984074	-13135.4	10.62	879615	0	122136	1576.1	10.58	876038	-3576	3577	42.6
2034	951731	322858	-628872	-1116579	-14880.9	10.61	951731	0	132394	1708.5	10.57	948153	-3577	3578	42.6
2035	1028725	349720	-679004	-1264246	-16824.1	10.59	1028725	0	143516	1852.0	10.55	1025146	-3578	3579	42.6
2036	1109451	378648	-730802	-1428555	-18983.5	10.55	1109451	0	155570	2007.6	10.51	1105871	-3579	3580	42.6
2037	1196511	410022	-786488	-1611111	-21381.1	10.51	1196511	0	168639	2176.3	10.47	1192931	-3579	3580	42.6
2038	1290842	444031	-846811	-1813776	-24041.7	10.47	1290842	0	182804	2359.1	10.44	1287263	-3578	3579	42.6
2039	1393224	480860	-912363	-2038661	-26992.7	10.43	1393224	0	198161	2557.2	10.40	1389645	-3578	3579	42.6
2040	1504361	520699	-983661	-2288015	-30264.4	10.40	1504361	0	214806	2772.0	10.38	1500782	-3578	3579	42.6
2041	1623682	563306	-1060375	-2564470	-33889.2	10.38	1623682	0	232849	3004.9	10.35	1620103	-3578	3579	42.6
2042	1753656	609404	-1144250	-2870724	-37904.2	10.36	1753656	0	252409	3257.3	10.34	1750077	-3578	3579	42.6
2043	1895460	659287	-1236171	-3209889	-42350.3	10.35	1895460	0	273610	3530.9	10.33	1898882	-3577	3578	42.6
2044	2050235	713249	-1336984	-3585494	-47272.7	10.35	2050235	0	296594	3827.5	10.33	2046658	-3576	3577	42.6
2045	2219122	771586	-1447535	-4001295	-52721.6	10.35	2219122	0	321507	4149.0	10.34	2215544	-3577	3578	42.6
2046	2403259	834589	-1568669	-4461551	-58751.8	10.37	2403259	0	348516	4497.5	10.35	2399681	-3577	3578	42.6
2047	2603832	902553	-1701277	-4970865	-65423.9	10.39	2603832	0	377789	4875.3	10.37	2600256	-3575	3576	42.6
2048	2822034	975775	-1846258	-5534368	-72804.6	10.41	2822034	0	409523	5284.8	10.40	2818458	-3575	3576	42.6

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low/low fertility and high economic assumptions.

Benefits and expenses	Fund D						Fund E						Fund F					
	Entry age normal funding						Entry age normal funding of retirement benefits, pay-go funding of balance						Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance					
	(\$M)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)		
1978	1382	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3	3.60	2101	719	1018	14.3		
1979	1764	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2	3.60	2403	639	1196	16.2		
1980	2198	12.76	9722	7523	1546	25.2	9.70	7385	5187	1488	22.8	6.29	4791	2593	1424	20.2		
1981	2640	12.76	11053	8413	2466	36.1	9.75	8441	5801	2164	30.8	6.41	5550	2910	1830	24.9		
1982	3153	12.76	12538	9384	3567	49.1	9.80	9627	6474	2970	40.3	6.53	6412	3258	2308	30.5		
1983	3700	12.76	14189	10489	4877	64.4	9.84	10941	7241	3924	51.4	6.63	7372	3672	2869	37.0		
1984	4332	12.76	16017	11685	6427	82.5	9.88	12400	8068	5049	64.5	6.73	8447	4115	3527	44.7		
1985	5060	12.76	18035	12976	8237	103.8	10.47	14790	9730	6377	80.6	7.37	10419	5359	4308	54.3		
1986	5934	12.76	20347	14412	10312	128.5	10.82	17248	11314	7966	99.9	7.78	12399	6465	5267	66.1		
1987	6922	12.76	22848	15927	12743	157.2	10.85	19415	12493	9866	122.3	7.85	14057	7136	6430	79.6		
1988	8032	12.76	25529	17497	15561	190.2	10.87	21751	13719	12069	148.1	7.93	15859	7827	7776	95.2		
1989	9267	12.76	28377	19110	18794	228.1	10.91	24246	14979	14596	177.6	8.00	17798	8531	9312	113.1		
1990	10632	12.76	31381	20750	22359	271.2	10.94	26894	16262	17381	211.3	8.08	19873	9241	10996	133.3		
1991	12090	12.76	34298	22208	26016	319.4	10.97	29489	17399	20236	248.9	8.16	21935	9845	12714	155.9		
1992	13690	12.76	37406	23716	30110	373.3	11.01	32266	18576	23434	290.9	8.24	24158	10468	14634	181.0		
1993	15446	12.76	40754	25308	34675	433.3	11.04	35266	19820	26999	337.8	8.32	26573	11128	16767	208.9		
1994	17373	12.76	44389	27015	39757	500.0	11.08	38533	21160	30968	389.9	8.40	29217	11844	19132	239.9		
1995	19481	12.76	48357	28876	45403	574.3	11.11	42104	22623	35375	447.9	8.48	32117	12636	21749	274.2		
1996	21759	12.76	52746	30987	51680	657.0	11.15	46065	24306	40275	512.5	8.55	35336	13577	24650	312.5		
1997	24255	12.76	57554	33299	58663	748.9	11.18	50406	26151	45729	584.3	8.62	38874	14619	27873	355.0		
1998	26992	12.76	62815	35823	66424	851.2	11.21	55164	28172	51794	664.3	8.69	42759	15767	31450	402.2		
1999	30000	12.76	68567	38567	75038	964.8	11.24	60379	30379	58524	753.2	8.75	47026	17027	35410	454.6		
2000	33297	12.76	74847	41550	84590	1090.9	11.27	66081	32784	65999	852.0	8.82	51700	18403	39810	512.8		

Benefits and expenses	Fund D						Fund E						Fund F					
	Entry age normal funding						Entry age normal funding of retirement benefits, pay-go funding of balance						Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance					
	(\$M)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri- butions (\$M)	Cash flow (\$M)	Inte- rest (\$M)	Fund (\$B)		
2001	36733	12.76	81672	44939	95119	1231.0	11.29	72264	35530	74252	961.8	8.87	56745	20012	44672	577.5		
2002	40552	12.76	89104	48552	106791	1386.3	11.32	79016	38465	83413	1083.6	8.92	62273	21722	50069	649.3		
2003	44807	12.76	97182	52376	119723	1558.4	11.34	86372	41565	93570	1218.8	8.97	68317	23510	56052	728.9		
2004	49569	12.76	105949	56381	134027	1748.8	11.37	94379	44810	104820	1368.4	9.03	74924	25355	62674	816.9		
2005	54902	12.76	115447	60545	149849	1959.2	11.40	103080	48178	117267	1533.9	9.08	82137	27235	69996	914.1		
2006	60703	12.76	125667	64964	167355	2191.5	11.42	112468	51765	131042	1716.7	9.13	89900	29197	78084	1021.4		
2007	67221	12.76	136713	69492	186657	2447.7	11.45	122623	55402	146233	1918.3	9.18	98354	31133	86987	1139.5		
2008	74570	12.76	148637	74067	207913	2729.7	11.47	133608	59038	162966	2140.3	9.24	107573	33003	96773	1269.3		
2009	82851	12.76	161495	78644	231283	3039.6	11.50	145474	62623	181366	2384.3	9.30	117620	34769	107514	1411.6		
2010	92215	12.76	175338	83123	257071	3379.8	11.52	158318	66104	201667	2652.1	9.36	128605	36391	119337	1567.3		
2011	102737	12.76	190048	87311	285735	3752.8	11.55	172015	69278	224227	2945.6	9.43	140397	37659	132444	1737.4		
2012	114385	12.76	205895	91511	317158	4161.5	11.57	186669	72285	248944	3266.8	9.49	153132	38748	146755	1922.9		
2013	127424	12.76	222976	95552	351573	4608.6	11.59	202534	75111	275989	3617.9	9.56	167082	39659	162357	2124.9		
2014	141964	12.76	241386	99423	389214	5097.3	11.62	219706	77742	305535	4001.2	9.64	182359	40395	179342	2344.7		
2015	158092	12.76	261225	103133	430336	5630.7	11.64	238258	80166	337777	4419.1	9.73	199053	40961	197811	2583.4		
2016	175677	12.76	282369	106692	475222	6212.7	11.66	258072	82395	372937	4874.4	9.81	217068	41391	217878	2842.7		
2017	195117	12.76	305189	110072	524178	6846.9	11.69	279501	84384	411225	5370.1	9.90	236765	41648	239661	3124.0		
2018	216535	12.76	329836	113301	577520	7537.7	11.71	302649	86113	452894	5909.1	9.99	258261	41726	263292	3429.0		
2019	240089	12.76	356462	116373	635612	8289.7	11.73	327651	87562	498199	6494.8	10.09	281708	41619	288913	3759.6		
2020	265921	12.76	385218	119297	698840	9107.9	11.75	354633	88712	547428	7131.0	10.18	307244	41323	316668	4117.6		
2021	294170	12.76	415916	121746	767617	9997.2	11.77	383491	89322	600877	7821.2	10.27	334819	40649	346726	4504.9		
2022	325121	12.76	449132	124011	842368	10963.6	11.79	414769	89648	658860	8569.7	10.37	364942	39821	379254	4924.0		
2023	358896	12.76	485102	126206	923590	12013.4	11.80	448621	89725	721736	9381.1	10.47	397773	38877	414431	5377.3		
2024	395693	12.76	524063	128371	1011820	13153.6	11.82	485282	89589	789895	10260.6	10.56	433552	37860	452492	5867.7		
2025	435650	12.76	566252	130602	1107639	14391.8	11.83	524926	89276	863763	11213.7	10.65	472459	36809	493656	6398.1		

Benefits and expenses	Fund D					Fund E					Fund F					
	Entry age normal funding					Entry age normal funding of retirement benefits, pay-go funding of balance					Entry age normal funding of non-indexed portion of retirement benefits, pay-go funding of balance					
	Cont. rate (%)	Contri-butions (\$M)	Cash flow (\$M)	Inte-rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri-butions (\$M)	Cash flow (\$M)	Inte-rest (\$M)	Fund (\$B)	Cont. rate (%)	Contri-butions (\$M)	Cash flow (\$M)	Inte-rest (\$M)	Fund (\$B)	
2026	479804	12.76	611193	131390	1211672	15734.9	11.84	567207	87404	943784	12244.8	10.74	514457	34653	538167	6971.0
2027	527318	12.76	660013	132695	1324496	17192.1	11.86	613099	85780	1030364	13361.0	10.83	560141	32822	586252	7590.0
2028	578091	12.76	713125	135034	1446965	18774.1	11.86	662884	84792	1124101	14569.9	10.91	609725	31634	638222	8259.9
2029	632191	12.76	770943	138752	1579903	20492.7	11.87	717021	84830	1225649	15880.4	10.99	663594	31404	694491	8985.8
2030	689639	9.69	633278	-56360	1720200	22156.6	9.66	631165	-58473	1332711	17154.6	9.78	639085	-50553	753742	9689.0
2031	748939	9.69	685032	-63906	1859777	23952.4	9.67	683277	-65660	1439598	18528.5	9.84	695763	-53175	812758	10448.5
2032	812098	9.69	741365	-70732	2010510	25892.2	9.68	740050	-72048	1554864	20011.4	9.90	757235	-54862	876523	11270.2
2033	879615	9.69	802653	-76961	2173313	27988.6	9.68	801936	-77678	1679306	21613.0	9.95	823886	-55728	945525	12160.0
2034	951731	9.69	869269	-82460	2349293	30255.4	9.69	869136	-82593	1813730	23344.1	9.99	895848	-55882	1020266	13124.4
2035	1028725	9.69	941593	-87131	2539628	32707.9	9.70	941886	-86838	1959081	25216.4	10.02	973287	-55437	1101285	14170.2
2036	1109451	9.69	1019479	-89971	2745537	35363.5	9.70	1020192	-89259	2116282	27243.4	10.04	1055808	-53642	1189170	15305.8
2037	1196511	9.69	1103951	-92559	2968595	38239.5	9.70	1105116	-91394	2286516	29438.5	10.05	1144826	-51684	1284591	16538.7
2038	1290842	9.69	1195516	-95325	3210091	41354.3	9.71	1197262	-93579	2470857	31815.8	10.06	1240956	-49885	1388175	17877.0
2039	1393224	9.69	1294675	-98548	3471685	44727.4	9.71	1297060	-96163	2670484	34390.1	10.07	1344640	-48583	1500634	19329.0
2040	1504361	9.69	1401938	-102422	3754934	48379.9	9.71	1404875	-99485	2886669	37177.3	10.07	1456265	-48095	1622607	20903.5
2041	1623682	9.69	1516654	-107027	4061653	52334.5	9.71	1520034	-103647	3120722	40194.4	10.06	1574706	-48975	1754847	22609.4
2042	1753656	9.69	1640770	-112885	4393718	56615.4	9.71	1644368	-109287	3373991	43459.1	10.06	1702390	-51265	1898098	24456.2
2043	1895460	9.69	1775076	-120383	4753134	61248.1	9.71	1778646	-116813	3648110	46990.4	10.05	1840215	-55244	2053147	26454.1
2044	2050235	9.69	1920364	-129870	5142058	66260.3	9.71	1923602	-126632	3944519	50808.3	10.04	1989048	-61186	2220866	28613.8
2045	2219122	9.69	2077430	-141691	5562879	71681.5	9.70	2079975	-139146	4264971	54934.1	10.03	2149762	-69359	2402082	30946.5
2046	2403259	9.69	2247060	-156198	6017949	77543.2	9.70	2248510	-154748	4611182	59390.5	10.02	2323225	-80033	2597823	33464.3
2047	2603832	9.69	2430050	-173781	6509969	83879.4	9.69	2429982	-173849	4985142	64201.8	10.01	2510350	-93481	2809021	36179.9
2048	2822034	9.69	2627192	-194841	7041779	90726.4	9.69	2625178	-196855	5388801	69393.7	10.01	2712053	-109980	3036762	39106.6
2049	3059029	9.69	2839277	-219751	7616377	98123.0	9.68	2834868	-224160	5824348	74993.9	10.00	2929236	-129792	3282210	42259.1
2050	3316009	9.69	3067102	-248906	8237094	106111.2	9.67	3059829	-256179	6294055	81031.8	10.00	3162807	-153201	3546530	45652.4

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low/low fertility and high economic assumptions.

	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Year interest first required from provinces (maximum fund)	1992	1991
Year fund first becomes negative	2001	1999

a Contributions continue to be 3.6 per cent of contributory earnings.

Source Data prepared for the Royal Commission on the Status of Pensions in Ontario, using the Commission's low/low fertility and high economic assumptions.

Canada Pension Plan, Comparison of Expenditures
as Percentages of Contributory Earnings, and the Fund
as a Multiple of Expenditures, Fund B,(a) Including
and Excluding the Baby Boom, Canada Less Quebec

Appendix G-6

	Canada less Quebec	
	Total population	Excluding baby boom
Year cash flow first set to zero	1986	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings		
1990	4.32	4.65
2000	5.68	6.15
2010	6.71	7.34
2020	8.81	8.99
2030	10.56	10.07
2040	10.40	10.39
2050	10.48	10.33
Fund as multiple of benefits		
1990	4.30	4.02
2000	3.26	3.06
2010	2.67	2.52
2020	2.08	2.07
2030	1.79	1.89
2040	1.84	1.87
2050	1.87	1.91

a Cash flow is not to be negative.

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario using the Commission's low/low fertility and high
economic assumptions.

Canada Pension Plan, Comparison of Expenditures
as Percentages of Contributory Earnings, and the Fund
as a Multiple of Expenditures, Fund C,(a) Including
and Excluding the Baby Boom, Canada Less Quebec

Appendix G-7

	Canada less Quebec	
	Total population	Excluding baby boom
Year cash flow first negative	1986	1984
Pay-go contributions in subsequent years, as percentage of contributory earnings		
2000	5.02	5.59
2010	6.45	7.11
2020	8.69	8.89
2030	10.50	10.02
2040	10.38	10.37
2050	10.47	10.32
Fund as multiple of benefits		
2000	1.28	1.01
2010	.46	.37
2020	.16	.13
2030	.06	.05
2040	.03	.02
2050	.01	.01

a Cash flow not greater than interest when negative.

Source Data prepared for the Royal Commission on the Status of Pensions
in Ontario using the Commission's low/low fertility and high
economic assumptions.

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement		Non-indexed	Pre-retirement		Non-indexed	Pre-retirement	
		indexing only	Fully indexed		indexing only	Fully indexed		indexing only	Fully indexed
1979	4,299	4,320	4,435	1.65	1.66	1.70	4.91	4.93	5.07
1980	4,421	4,500	4,920	1.52	1.55	1.69	4.45	4.53	4.95
1985	4,942	5,704	7,882	.99	1.15	1.59	2.74	3.16	4.37
1990	5,623	8,293	12,529	.71	1.04	1.57	1.80	2.65	4.02
1995	6,191	11,896	18,475	.50	.97	1.51	1.30	2.50	3.87
2000	6,626	16,757	26,460	.35	.88	1.39	.90	2.28	3.60
2005	6,989	23,430	37,345	.24	.80	1.27	.62	2.08	3.32
2010	7,725	35,372	55,243	.17	.79	1.24	.46	2.11	3.26
2015	8,986	56,510	85,999	.14	.85	1.30	.36	2.26	3.42
2020	10,424	87,924	133,501	.11	.91	1.38	.28	2.36	3.62
2025	11,891	132,553	203,802	.08	.94	1.45	.22	2.45	3.79
2030	13,100	190,899	300,439	.06	.93	1.46	.17	2.48	3.82
2035	13,380	249,212	410,631	.04	.82	1.34	.11	2.05	3.52
2040	13,214	318,614	542,691	.03	.70	1.19	.08	1.93	3.14
2045	13,181	424,872	724,420	.02	.63	1.08	.05	1.61	2.84
2050	13,420	588,189	987,060	.01	.59	1.00	.04	1.75	2.63

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's "low/low" fertility and "high" economic assumptions.

	Millions of dollars			Percentage of GNP			Percentage of CPP/QPP contributory earnings		
	Non-indexed	Pre-retirement		Non-indexed	Pre-retirement indexing only		Non-indexed	Pre-retirement indexing only	
		indexing only	Fully indexed		indexing only	Fully indexed		indexing only	Fully indexed
1979	1,535	1,615	1,658	.59	.62	.64	1.75	1.84	1.89
1980	1,553	1,650	1,803	.53	.57	.62	1.56	1.66	1.81
1985	1,618	1,943	2,684	.33	.39	.54	.90	1.08	1.49
1990	1,710	2,610	3,942	.21	.33	.49	.55	.84	1.26
1995	1,822	3,620	5,621	.15	.30	.46	.38	.76	1.18
2000	1,906	4,980	7,868	.10	.26	.41	.26	.68	1.07
2005	1,968	6,815	10,869	.07	.23	.37	.18	.61	.97
2010	2,128	10,070	15,734	.05	.23	.35	.13	.59	.93
2015	2,415	15,695	23,889	.04	.24	.36	.10	.62	.95
2020	2,730	23,822	36,148	.03	.25	.37	.07	.65	.98
2025	3,031	34,909	53,706	.02	.25	.38	.06	.65	1.00
2030	3,254	48,988	77,146	.02	.24	.37	.04	.62	.98
2035	3,240	62,389	102,783	.01	.20	.34	.03	.54	.88
2040	3,122	77,804	132,545	.01	.17	.29	.02	.45	.77
2045	3,039	101,367	172,687	.005	.15	.26	.01	.40	.68
2050	3,017	136,707	229,374	.003	.14	.23	.01	.36	.61

Source Data prepared for Royal Commission on the Status of Pensions in Ontario, using the Commission's "low/low" fertility and "high" economic assumptions.

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